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Liebig's Work.

IN his inaugural address Dr. WILLIAMSON, President of the British Association for the Advancement of Science, spoke of the famous Chemical School at Giessen, Germany, and of its illustrious founder, LIEBIG, as follows:

"Allow me at this point of my narrative to pause for a moment in order to pay a tribute of respect and gratitude to the memory of one who has recently passed from among us, and who, in the time of his full activity, was a leader of the discoverers of new facts in the most difficult part of our science. LIEBIG has been generally known in this country through his writings on agricultural chemistry, through his justly popular letters on chemistry, and other writings, by means of which his brilliant intellect and ardent imagination stimulated men to think and to work. Among chemists he was famed for his discoveries of new organic compounds, and their investigation by the aid of improved methods; but I believe that the greatest service which his genius rendered to science was the establishment of the chemical school of Giessen, the prototype of the numerous chemical schools for which Germany is now so justly celebrated. I think it is not too much to say that the Giessen laboratory, as it existed some thirty years ago, was the most efficient organization for the promotion of chemistry which had ever existed. Picture to yourselves a little community of which each member was fired with enthusiasm for learning by the genius of the great master, and of which the best energies were concentrated on the one object of experimental investigation. The students were for the most part men who had gone through a full curriculum of ordinary studies at some other university, and who were attracted from various parts of the world by the fame of this school of research. Most of the leading workers of the next generation were pupils of LIEBIG; and many of them have established similar schools of research. We must not, however, overlook the fact that LIEBIG's genius and enthusiasm would have been powerless in doing this admirable work, had not the rulers of his Grand Duchy been enlightened enough to know that it was their duty to supply him with the material aid requisite for its successful accomplishment."

Casualties.

THE disturbances at the Port Henry iron works lately culminated in an occurrence which ought to arouse the most determined attention of the managers of that establishment. The Rutland, Vermont, *Herald* says: "On Wednesday morning last, about 2 o'clock, Mr. WALTER TEFFTS, overseer of the Port Henry Iron Ore Company's mines, at Mineville, N. Y., was awakened by the report of guns, which were being fired directly at, and apparantly in the immediate vicinity of, his house. He sprang out of his bed, followed by his wife, and, soon after, detected the smell of a burning fuse. He rushed out, and quickly discovered, a few feet from the house, a three-minute fuse still burning freely. Attached to the other end was a keg of powder, which was placed directly under his house. He was almost stunned by the discovery, but severed the connection between it and the powder, and thus averted a most terrible calamity. Previous to the awakening of Mr. TEFFTS, there had passed through the house seven bullets in near proximity to where he and his wife slept. No reason for this outrage can be given, execept it may be from the recent troubles the miners had with the company, and the fact that an appointee of Mr. TEFFTS took the place of one discharged, all done, however, according to the company's order. The directors of the company were called together to take action in the matter, but we have not yet learned the result of their meeting."

AN explosion occurred October 6, at WILLIAM SMITH & SONS' National Pipe Foundry in Pittsburg, Pa. The men were engaged in casting a thirty-six-inch pipe for the new waterworks of this city, when some water came in contact with the molten metal, and a terrible explosion followed. Several men were severely burned by the hot metal, which flew in all directions. One man, named John Frazier, who was standing over the pit where the casting was being made, had his face and back badly burned and was otherwise injured. Immediately following the explosion the foundry took fire, and was saved with difficulty. The loss is stated by Mr. SMITH to be about $69,000—fully covered by insurance.

Coke Ovens.

(CONTINUED FROM PAGE 228.)

THE Coppée system is just now in great favor. Belgium counts 524 furnaces of this class in activity, of which several groups are near Liege, and 192 in course of construction; Prussia, 1,305 at work, and 138 in course of construction; France, 186 in operation; England, 30, at the Coppée Coke Company, at Shorncliffe, and a new group of 30 ovens being built.

As in the system previously described, the Coppée ovens are placed together in groups of two and two. The flame from the two ovens of the same group passes through a series of openings in the arch, and circulates through suitable channels around the oven, then, passing beneath the sole of the adjacent oven, enters a common conduit, which first goes beneath the boilers and then leads to the chimney. The gases are burnt in the channels by numerous jets of warm air. Galleries under the brickwork are traversed by currents of cold air, which cool and preserve the construction. To diminish the loss of heat, the tops of the ovens are covered with a bed of clay, about 18 inches thick, on which bricks are laid.

The ordinary dimensions of an oven are: Length, 9m.; width, 0·45m.; height, 1·20m. for a coking of 24 hours. For a coking of 48 hours the width is 0·60m., and the height is 1·70m. The ovens are quickly filled by three charging hoppers. The characteristics of the Coppée furnace are: 1. A small width, and an arrangement of channels especially suited for poor coals. 2. A combustion of gas by a double admission of air, which entirely suppresses the smoke. 3. The combination of all the hot gases in a large conduit beneath the ovens, and their utilisation for heating boilers. It is estimated that a furnace can heat a 3 or 4-horse boiler. This force is employed for breaking the coal, discharging the coke, etc. A furnace gives 2 tons of coke per 24 hours. The duty is high, and the quality of the coke produced extremely good. A furnace, including foundation to a depth of 1·85m. below the ground level, costs 2,500f. A group of 26 ovens, including breakers, discharging apparatus, waggons, distribution of water boilers, etc., costs 106,000f.

It has been urged that the Coppée ovens are too light on account of the side walls, which are only 0·33m. thick, including a space 0·09m. for the passage of gas. But from the experience obtained we may safely assert that this criticism is entirely an unjust one.

Comparative experiments made in England on the elliptical beehive ovens and the Coppée furnaces give the following results, which we extract from the paper of Mr. BAINBRIDGE:

CHIEF POINTS OF COMPARISON BETWEEN THE BEEHIVE AND THE COPPÉE OVENS.

Chief Points.		Common Ovens.	Coppée Ovens.
1. First cost per 2 tons of coke per day		£119·7	£100
2. Time burning		48 to 120 hours.	24 hours.
3. Area occupied per ton of coke per day		1,218 sq. feet.	234 sq. feet.
4. Per cent. of yield	washed	45 per cent.	59 per cent.
	unwashed	54 per cent.	68 per cent.
5. Area outside cooling surface per 2 tons of coke per day		1,002 sq. feet.	175 sq. feet.
6. Time occupied in emptying and refilling		60 minutes.	8 minutes.
7. Units of heat in waste gases given off per oven per day		966,710	1,401,584
8. Labor charges (cost of coking) per ton		1s. 3d.	11d.

The arrangements for charging and emptying show, also, a marked improvement in the yield; but MM. Appolt, in placing the retorts vertically, and effecting the filling and emptying by gravity, appears to have made the greatest improvement possible in this detail. At Ougrée and at Seraing several groups of ovens are built on this system.

An Appolt group comprises 12, 18, or 24 retorts, ranged in two lines. Each retort is 4m. or 5m. high. To facilitate the exit of the coke, the retorts are made taper, so that at the top they measure 1·10m. by 0.35m., and at the bottom 1·25m. by 0.45m. The bottom of the retort is closed during the coking by a sliding door. The charge is made first with coke dust, with which a bed about 0·30m. thick is formed. The charging wagon is then brought over the mouth of the retort, and the load is emptied. The mouth is closed with bricks, and luted with clay, so that the charge is thus hermetically sealed.

By the heat applied at the sides the gases are distilled, and escape by small openings 0·15m. by 0·02m. high, and placed 0·40m. from the bottom. The gases are discharged into an annular space around the compartment, in which they are burnt, with air introduced through openings in the furnace. The heat developed by their combustion effects the carbonization of the coal. The products of combustion reach the chimney by means of twelve horizontal channels, fitted with valves, and arranged in such a manner as to distribute the heat equally over the whole group. To discharge the retorts the door is opened, and

the coke falls into a wagon, lined within with firebricks. The coke is quenched by water.

The advantages which have been sought for in this construction are as follows:

1. The calcination is effected in a closed chamber solely by the combustion of gas disengaged from the coal, a condition favorable to a high yield.

2. The heating surface is very considerable, reaching 190 square metres for a charge of 1·5 tons. The comparative small size of the retort secures a rapid and regular carbonization.

3. The flames from all the compartments, uniting in a common chamber, which surrounds them, insures a uniformity of temperature.

4. The vertical position of the compartments, besides the facility for rapid charging and emptying, gives more compactness to the coke, whilst the arrangement occupies less space.

The following are the inconveniences incident to the system:

1. If the general arrangement does not allow of the coal being led direct out upon the loading platform, lifts must be provided to raise it.

2. Masses sometimes adhere to the sides of the retorts, which have to be broken before the coke can fall.

3. The management of these ovens is not so simple as in some other systems, and when repairs are required for one compartment, the whole group has to be stopped.

At the works of Marihaye and Seraing, the compartments are 4.5m. in height, of which from 3·20 to 3·40 are occupied by the charge; the upper opening measures 1·12m. by 0·29m., and the lower one 1·25m by 0·43m. This charge is composed, besides 115 kilos. of coke cinders thrown in first, of 1·2 ton of dry coal. The Marihaye coal, previously washed, is calcined in these ovens; 1 ton of gross coal gives ·890 tons of washed coal, ·095 tons of stones, and ·015 of dust. The time for coking is 24 or 26 hours. The percentage of duty is 78 per cent. with dry coal, and this rises even up to 80 per cent. The coke from these ovens is of a remarkable compactness and hardness, and is well suited for transport. While ordinary coke weighs from 400 to 500 kilos. the cube metre, the coke at Seraing, made in the Appolt furnace, weighs 530 kilos, and sometimes 560 kilos.

For complete works, we estimate the comparative cost of establishment per ton of coke, not washed, produced in 24 hours. In the Coppée system the cost was 2,500f.; in the Smet, 3,500f.; and in the Appolt, 5,000f. On the other hand, the Coppée furnaces occupy double the area, and the Smet two and one-half times the area of the Appolt ovens, for an equal production.

Report on the Passaic River.

PROF. HENRY WURTZ has made a report to the Jersey City Commissioners of Public Works on the condition of the Passaic river, and has added some suggestions on the best means of improving the quality of the water. For this purpose he recommends aeration of the water in the reservoirs. He says:

"Now that we are acquainted with the nature of the wonderful process of regeneration and revivification that goes on in our water, it behoves us, in fact, if within our power, to promote it, to assist nature, and to study the means of doing so, without delay. What conditions, then, should we supply to the water in order to promote this process? Evidently two, oxygen and time; or, as it may be better to express it, opportunity to absorb oxygen, and time for the oxygen to do its work. One suggestion to be thrown out here amounts simply to this; that, if means were adopted to keep the water in one of your reservoirs in a condition of gentle agitation, or rather intestinal motion, in every part, so as continually to turn up new surfaces to the air, the absorption of oxygen would be enormously promoted. To support this assertion, it may be stated that, by the new method, the water taken from the receiving reservoir on the 10th of October last was found, when standing *at rest*, at 60°, to absorb oxygen from the air in 12 hours to the depth of 4.75 inches, and in 24 hours to the depth of but 7.5 inches. After this the absorption became very slow, and in two days almost imperceptible. The motive power for keeping the reservoir water in motion would be trifling, and readily obtainable from the inflowing water. The immediate objection made will be that one function of the reservoirs is to cause the water to *settle* and deposit its sediment, and that motion will interfere with this. This is by no means certain, as there are reasons that have led your reporter to the opinion that thorough aeration will tend to promote separation of the sediment; but, be this as it may, it is very probable, from the analytical results presented in this report, that little or no settling is actually accomplished, in your distributing reservoir at least. The water from the receiving reservoir of October 10th gave 0·479 of sediment, while that from the hydrant in Hoboken of November 1 gave 0·493. The latter result agrees also with that of Prof. CHANDLER, who found, in hydrant water of May 3, 0.520 of sediment. One reservoir might, at present, be sufficient for settling purposes. As said before, however, this novel idea is at present thrown out merely as a suggestion, to be considered by your Board in case you decide to adopt temporary expedients. Its applicability would, of course, be greatest during those seasons when the reservoirs, lying in hot, still sunshine, for whole days together, are obviously in the condition, more than any other, of stagnating pools, in whose bosoms all kinds of organic changes, including putrefaction (in the absence of abundant oxygen), as well as germination, may well be believed to find most favorable conditions.

Not being able to find any data for the computation of the flow of the Passaic river, it was determined to make a careful measurement of its water-shed or basin, which was accomplished by the method of weighing.

Three sections of the large geological map of the State were found, on being pieced together carefully, to cover all but a very trifling corner of the water-shed at the head waters of the Saddle river. The wonderfully tortuous rim of the basin was now very carefully traced out all around, following a medial line between the heads of the small tributaries and those of the adjoining basins, using a soft pencil. Tracing muslin of the best quality was now superposed, and the former line following round again. Small, sharp scissors were now called into requisition, the water-shed cut out, carefully rolled up, and weighed on a delicate chemical balance. One hundred and twenty square inches of the same muslin were then carefully measured out, cut out in the same way, and also weighed. As the scale of the map is two miles to the inch, this represents 480 square miles. The weight of this and of the whole water-shed being known, it becomes a simple rule-of-three sum.

Two such maps were made. One on which I endeavored roughly to trace out the river and its main tributaries, I present herewith, that you may be enabled to inspect the form of this singular basin. On the other were traced out, before detaching it, the boundaries of the different geological formations that are included within the basin, also the State line between New Jersey and New York. This latter map was dissected and weighed piecemeal, to determine these different areas.

The following are the figures obtained:

	Square miles.
Area of Passaic water-shed	908
Area of the New York portion thereof	148.5
Area of the crystalline rocks of the Highlands, within the water-shed	484.5
Area of the Brown "Sandstone" and Trap (Triassic) formations	423.5

[It was the original intention to enter into some geological, or rather lithological discussion, based on the measurements and the bearing of the results of the analysis upon the composition of the rocks, the more especially as your reporter has spent much of his life in the study of the rocks, minerals, and general geology of northern New Jersey. It was intended to calculate the rainfall in the basin for each month in the year, and other interesting matters besides, but it is now feared that the necessary limits of this report would be surpassed.]

The water-shed of the Passaic, it thus appears, is much larger than had been anticipated, and it is evident that the estimates heretofore accepted of the average flow of this stream are greatly below the truth. The annual rainfall is known to be more than 50 inches,* and a simple calculation shows, therefore, that the total amount of water received by the Passaic and its tributaries in one year is 782,100,500,000 gallons, or 2,115,000,000 gallons per day, on an average. As it is usual to allow a loss of one-half, however, by evaporation, it will be safe to call the average daily flow of the Passaic one thousand million gallons. This is not much less than the average assigned to the River Thames—1,350,000,000 gallons, although that river is more than 250 miles long, and ours but eighty miles. This fact serves to illustrate the very remarkable character of the Passaic basin. The rainfall, however, in the Thames valley is but 27 inches. The Croton water shed measures 339 square miles, so that our water shed is 2.7 times the size of that which supplies New York City. Nine-tenths of this water shed lies above Patterson, and its drainage flows over the falls at that place. We have water enough (with reservoirs of sufficient capacity and in proper locations) for all our cities for centuries to come, not only for domestic, steam, and manufacturing uses, but even for water power, where small powers are required (as for sewing machines, for example.) The problem is, how to make it come to our cities without constantly augmenting cost. This, however, is a matter outside the scope of the present report.

SUMMARY.

1. The basin drained by the Passaic River contains over 900 square miles of territory, and receives annually over 782,000,000,000, or, as daily average, over 2,100,000,000 of gallons of water.

2. Allowing an average loss of one-half by evaporation (doubtless an overestimate), the annual flow of the river at Newark is 390,000,000,000 gallons.

3. The actual daily flow varies within wide limits, as yet undetermined, possibly between 200,000,000 to 300,000,000 per day during the dryest summers, and 2,000,000,000 or 3,000,000,000, or more, during times of flood.

4. The daily flow, with the river at an average height, may be called 1,000,000,000 gallons, more than nine-tenths of which, say 900,000,000, must flow over the Falls of Patterson. The whole discharge of this river is 2.7 times that of the Croton River, which supplies New York.

5. The water belongs naturally to the class known as "peaty" waters, though not largely imbued with this contamination, at least in the lower part of its course.

6. From the Falls down to the mouth the peaty matter gradually diminishes in amount.

7. The water is alkaline in character, or at least has a considerable excess of basic over acid constituents. The amount of lime and magnesia vary at times, but do not differ much from the average of the Croton water.

* The mean annual rainfalls were, for a series of years:

For Newark	50.2
For Paterson	51.2
For Dover	50.5
Mean	50.5

8. In the lower part of its course, at least, the river contains in solution quantities of *nitrates*, sufficient to be easily and accurately determined by delicate analysis.

9. These nitrates are increased in quantity by flowing through the city of Paterson, and again nearly doubled by flowing through Newark.

10. These (or their nitric acid) are derived from the oxidation of the animal excretions and other similar refuse that pass into the river at Newark, Paterson, and elsewhere, from sewers, slaughter houses, and other sources—materials that would otherwise remain in the water in a state of putrefaction.

11. There is no reason to believe that these nitrates affect health in any way whatever.

12. The oxidizing power of this alkaline river-water, in the *autumn* season, is so great that but slight traces of the sewer matter can be detected after flowing but four miles through the channel, so little being left that the water acquires no odor on being kept in a closed bottle at 60° Fahr. for one month.

13. There are as yet no results on record in the way of tests during the *summer* season, when the water absorbs much less oxygen.

14. This water allows the germination and supports the growth of green confervoid vegetation in its bosom, under favorable circumstances, until after it has passed through the city of Newark, when it *loses this power*, losing some of its constituents at the same time, while gaining others, and changing materially in composition.

15. In the opinion of the undersigned, it will not be safe to have sewers from the city of Newark, *at any season*, discharge into the river nearer to the pumping works than they do at present, unless the water is conducted to the pumps from a point correspondingly further up the river.

16. This latter precaution is suggested for adoption at once, so long as the present pumping stations are adhered to.

17. It is suggested also that the practicability be examined into, by the engineer of your Board, of keeping the water, in at least one of the reservoirs, during the summer months at least, in a condition of slow intestinal motion, or agitation, in order to promote absorption of oxygen and consequent destruction of organic impurities.

18. No metallic or mineral poison can be detected as cast into the stream at Paterson, nor could any such remain in solution therein for any length of time.

Rock-Boring Machines in Europe.

THE use of rock-boring machines, with compressed air as motive power, increases rapidly in the mining districts of the Continent. On former occasions (see ENGINEERING, vol. xiii., pages 200 and 409) we have given some notes on the Sachs rock drill, as employed at the Altenberg mines, near Aachen; at Stahlberg, near Siegen; and Commern Bleiberg, near Bonn. We now add a few remarks on the same machine, which is in operation at the Gouley mine, near Kohlscheidt, belonging to the United Coal Company of the Wurm district, in Rhenish Prussia. A crosscut, over 1640 ft. long, 6.8 ft. high and 6.8 ft. wide, was driven there, at a depth of 852 ft. from the surface. The rock consists of hard quartz sandstone, alternating with hard shales, and contains a few coal seams. The point of the tool was at first chisel-shaped, and it happened sometimes that the holes were not boared straight, in consequence of which the tool was liable to jam and to cause the breaking of the valve gear; but since the points have been made Z-shaped, such accidents have never again occurred. In very hard rock, which entirely consumed the points of the tools, the machine would bore from 29.6 in. to 41.6 in. in half an hour; when two men under similar circumstances, boring by hand, could only advance 10.4 in. in eight hours. When the material is less hard, 25.12 in. to 29.6 in. are drilled in 6 to 7 minutes; the changing of the tool requires 2 to 3 minutes, the removing of the machine 4 to 5 minutes, and a hole of 28 in. depth, which requires one change of tools, can thus be drilled in 12 to 15 minutes. In hard shale the machine advances 4 in. to 4.5 in. per minute of actual boring time, with 350 to 400 blows. The compression of the air is equal to 4 atmospheres in the compressor, and 3¼ in the machine. The pipes through the shaft are made of cast iron 4.20 in. diameter; those through the levels are of wrought iron and 3.6 in. diameter; 12 to 14 holes divided over the surface of the heading are generally fired at the same time. The compressor is worked with water, as dry compressors get inconveniently hot; the expenses per running metre of crosscut are as follows:—Wages, 39s.; repairs, 3s.; interest and amortisation on a capital of £165, 3s.; expenses of compressed air, 1.5s., or £2 6s. 6d in all; while the expenses of driving by hand power are on an average £3 3s., and even reach up to £7 10s. per each current metre.

Another boring machine which has undergone trial is that of Burleigh, made by CRAVEN BROTHERS, of Manchester. It came originally out in America under a somewhat different form, and was employed in driving the Hoosac Tunnel in Massachusets. In the autumn of 1871 it was tested at the Turin Industrial Museum, when a sample of the smaller size, weighing only 176 lb., bored in 7 minutes, in hard granite, a hole 16 in. deep and 16 in. diameter, and also perforated with ease such hard kinds of rock as quartzite, gneiss, and others. In 1872, the same machine was tested by M. COLLADON, at Geneva, when a large block of hard granite from the Arve Valley was perforated with a hole 1.52 in. diameter and 1.8 in. to 2 in. deep a minute, under 4 atmospheres pressure. The piston and chisel receive a turning movement with each upward stroke, when the piston slides on a slightly curved guide rod, which is at its end provided with a ratchet wheel and pawls, and thus prevents their turning backwards at the downward strokes. This arrangemen tis, however, not original, for it was patented in England some years ago by John Darlington.

A third successful machine we saw at Vienna, exhibited by JOHN COCKERILL & Co., of Belgium; it is the Dubois-François rock drill, shown in four specimens, which are mounted on little carriages, as used in some Belgian collieries. This machine is in Belgium supplied with compressed air of 2 to 2½ atmospheres, has a stroke varying from 80 in. to 7.20 in. in length, and is said, in a hard coal sandstone and coal shale, to drill a hole 1.6 in. to 8 in. deep in a minute, when it makes from 200 to 250 strokes. The driving of a crosscut through sandstone, 7.21 ft. high and 7.21 ft. wide, has cost per current metre 41s. 6d., when four machines were used in turn, and the driving advanced three times as fast as when done in the ordinary way. We understand that this machine is next to be tried at the Gothard Tunnel. There is no doubt that rock-boring machines have been much improved during the last ten years; there remain, however, still some objections to be overcome before their use can become general. The machine of the future should have less weight than hitherto; there should be no heavy frame to it, and it should be such as to allow of setting it to work in every direction, upward, downward, horizontal, or inclined; the pressure used should be equal to at least 4 atmospheres; the number of strokes should be increased at least twofold; as it is now, however, the length of stroke should be shortened; the valve and slide gear must be simplified, as they are always liable to get out of order and consume a great amount of power; and lastly, to avoid complications, its self-acting forward movement of the cylinder should be dispensed with, as this is better done by the hand of the man who has to attend the machine.—*Engineering.*

The Cockerill Iron and Steel Works, Seraing.

SINCE the death of JOHN COCKERILL, the works at Seraing have been further enlarged, and at the present time they occupy a position perhaps second only to those of Krupp at Essen. The collieries are four in number, and are worked at depths of about 500 yards by the aid of twenty-four engines, giving a total of 900 horse power. They give employment to 2,400 workmen, and their annual production is 350,000 tons. The company always keep from fifteen hundred to two thousand tons of coal on hand in case of a strike or of any other emergency. The workings in the collieries were formerly carried on in hard ground by the aid of dynamite as a blasting agent, but for the last eight or nine months the lithofracteur of Messrs. KREBS, of Cologne, only has been used. In a report by M. SADOINE upon the use of the latter material, that gentleman states that dynamite has the disadvantage of incommoding the miners by its deleterious fumes, even when used in unconfined spaces. That objectionable feature, however, says M. SADOINE, disappeared at Seraing with the substitution of lithofracteur, the gas generated not proving more baneful than that of ordinary gunpowder, whilst greater explosive power is developed than with dynamite, which has led to a considerable economy in working by a reduction of the number of bore holes required. The coke furnaces consist of four groups, comprising 143 horizontal kilns, and twelve groups, comprising 216 Appolt kilns. Connected with them are six washing machines, and thirteen steam engines of 168 horse power collectively. The combined influences of heat, wind and dust forbade an examination of these washing machines, the kindly offer of a bath by the workmen notwithstanding. The number of workmen is 140, and the annual production of coke is 140,000 tons.

The blast furnaces are five in number, with stoves for heating the blast and tapping sheds for ordinary pig iron. In this department are fifteen engines of 480 collective horse power, and 300 workmen, the annual yield being 55,000 tons. Two of these engines are large horizontal blowing engines, the only thing noticeable about them being a system of positive automatic lubrication This consists of an oil cup on each air cylinder, the cock of which is connected with the engine in such a way that at every stroke a drop of oil finds its way to the rubbing surfaces. There are four more blast furnaces now in course of construction for producing steel pigs. There are two foundries for iron and one for copper, employing 280 workmen, and six engines of 90 horse power collectively, the annual yield being 5,000 tons. The walk through these foundries was somewhat hurried, but sufficient time was allowed in the iron foundry for the visitors to witness the casting of a cylinder for a blowing engine, this cylinder being 10 ft. in diameter, 8 ft. stroke, and weighing 12 tons. The casting was most successful. The foundries are large and commodious, and are well fitted with cranes and other appliances, suited for the heavy work turned out there. The castings in and about the foundries were decidedly good and clean.

In the wrought iron department there are 75 heating furnaces, 7 steam hammers, 12 rolling mills, and 55 engines of 1,900 aggregate horse power; the workmen number 1,240, and the annual production is returned as 40,000 tons in rails, girders, bar and sheet iron. The heavy plate mill is driven by a fine pair of Ramsbottom's reversing engines, which present a very solid and handsome appearance, and which, being placed on good foundations, have given no trouble whatever. One peculiarity we noticed in these engines is that instead of being driven with a link motion with three eccentrics, as is frequently done in England, they are driven with a straight Allen link motion. In one department the milling and punching of the rail ends was being carried on by the aid of several special machines, Continental engineers being more particular in this respect than those of our own country. They require great exactness, hence the importance attached to this operation and the care with which it is performed. A very fine mill by COLLIER, of Manchester, was at work rolling tyres for railway wheels, and a noticeable feature here was the care taken to insure the identification at any time of every tyre rolled in this mill by impressing it with no less

than fourteen stamps. This was no special occurrence, in honor of the visit of the Iron and Steel Institute, but ordinary every-day practice. Besides this mill we also found two vertical tyre rolling mills, made at the Seraing Works, which were remarkable chiefly for their antiquity, being of very primitive construction and early date—perhaps the oldest on the Continent. Another mill was engaged in rolling spoke iron for railway wheels.

In the steel works are ten Bessemer converters of from 5 to 7 tons (six of which are in course of erection), 16 heating furnaces, 7 steam hammers, 4 rolling mills, and 46 engines of various kinds, of 3079 horse power collectively. This department employs 560 workmen, and turns out 17,000 tons of steel annually. This yield, however, will be greatly increased as soon as the new and very extensive Bessemer works are completed. The four 5-ton converters which we found at work turn out only three charges per day from each converter, which may be considered as a very low yield as compared with English practice, to say nothing of America. The spectrum analysis is always used during the blowing process, although to our mind the man in charge of the blowing machinery appeared to control the operations rather than the chemist at the spectroscope. Two little novelties in detail were to be seen in this department. The first of these was a canvas breeches placed round the ram of the ladle crane, which served to keep it clean, the canvas accommodating itself to the ascent or descent of the ram. The canvas is kept wet by the occasional application of a jet of water. The second little detail was a spiral spring placed over the hook of the ingot crane, which simple addition prevents jerking, and enables the mould to be lifted steadily and without accident. In the forges are 12 heating furnaces, 7 steam hammers, 70 smith's fires, and 5 engines of 288 horse power, the number of workmen being 200, and the annual production 1500 tons of large and small work. Three of the steam hammers are of large size, and one was at work forging a steel shaft weighing 15 tons. We noticed with regret that the furnaces were all ordinary coal-burning, instead of being on the Siemens principle, which has met with such marked success in this special branch of industry.

The machine shops are well arranged and appointed, and contain 368 tools, including lathes, shaping, planing, slotting, drilling, boring, and other machines. There are two hydraulic presses, a number of portable, fixed, and overhead traveling cranes, and 20 steam engines representing 264 horse power. The workmen here number 1,400, and the weight of the machinery produced annually is put at 7,000 tons.

In the bridge-building department and the boiler shops are 55 drilling, bending, shearing, planing, rivetting, and other machines; 3 hammers, 54 furnaces, and 11 engines of 120 collective horse power, with 500 workmen, the annual production being 6,000 tons. The work turned out in the boiler shops is very good, the marking off being done in a systematic and workmanlike manner. Besides a number of marine and stationary boilers for general purposes, was one for one of the enormous locomotives now being constructed at Seraing to work the Liege incline. The boiler shop boasts of a very good steam rivetting machine, in connection with which we found a steam crane for hoisting the work about.

All the plain cylindrical boilers have their ends flanged and dished out by a powerful press of good design. It consists of a wrought-iron girder framing carried on cast-iron columns, in one of which the steam engine for working the press is placed. A die having a rounded face is attached to a heavy vertical geared plunger, connected by multiplying gearing with the steam engine; a matrix corresponding in size and curvature to the die is placed centrally beneath it, and the die descending upon the red-hot plate, presses it into the required shape. This press has a power of 200 tons. A boiler end 6 ft. in diameter was flanged by this machine whilst the visitors were present, and an excellent job it made.

Outside one of the shops were two Sommellier drills operating on a block of limestone, and in an adjoining building was a pair of horizontal engines working under a water column, and which were employed in compressing air for the drills.

The iron mines belonging to the company, by which they have secured a supply of iron for 100 years, are not at Seraing, as already observed, but in the Liege and Namur districts, as well as in Luxembourg and Spain. They are 30 in number, and those in Belgium employ 17 engines, and 800 workmen, the annual yield being 150,000 tons. The company's shipbuilding yard is at Antwerp, where they construct both ocean and river steamers.

It will thus be seen that, so far, at the Seraing Works alone more than 7,000 hands are employed, whilst the engines represent considerably more than 7,000 horse power. But this is not all, for there is a brick-field producing 15 millions of bricks per year, and giving work to a large number of hands, besides which there are 15 locomotives of small power for haulage purposes, and 420 workmen employed on the system of railways by which the works are traversed, and thus connected with the main railways of the country. The small engines used for shunting and haulage purposes on the works are similar to those exhibited at Vienna.

Besides the locomotives there are also 80 horses employed about the works, 15 of them being in the collieries. From the annual report for 1872 it appears that there were 8,912 persons employed on the works; 254 steam engines of 7,834 collective horse power; the wages paid amounted to 8,500,000 francs; the fuel consumed amounted to 350,000 tons, and the produce is put down at £1,200,000.

It may readily be supposed that an establishment like that at Seraing does not consist wholly of work-shops and machinery, but that in such a community the interest and welfare of the employees receive some consideration. This is especially so here, for houses have been built for workmen, and attached to each department of the works is a large dining-room, with a kitchen, proper arrangements being made for the custody of each workman's provisions. Similar arrangements are carried out at the collieries, where there are also baths for the use of the miners. There is likewise a dispensary, from which medicine is delivered gratuitously to all those employed on the works and their families. On the heights of Seraing, a short distance from the works, and in an elevated and healthy situation, is a hospital built by the company. It has a special physician attached to it, and will accommodate between 80 and 90 patients, the staff of nurses and attendants consisting of nuns. There is also an orphanage near the hospital, at which 45 children of both sexes are now being brought up, most of whom lost their parents during a visitation of cholera at Seraing. Besides all this, the company extends its care to the future as well as to the present welfare of the workmen, and has established a society for relief and pensions. It is not compulsory on the workmen to belong to the society, but they are expected to join it, and every inducement is offered to them to do so. The company, however, in really deserving cases, grants, out of its own funds, temporary relief and pensions to those who do not belong to the society. We thus have an establishment possessing enormous resources, and being entirely self-contained and self-supplying, and independent of external aid except in the matters of copper and timber. The company is managed by a board composed of five members, the active supervision of the works devolving upon M. Sadoine, as director-general, who is assisted by twelve chief engineers, each of whom is placed in charge of a distinct department. The working staff have suites of offices, besides which there are arrangements for facilitating engineering studies; there is also a library and a laboratory attached to the establishment. One thing which strikes the visitor to Seraing, is the extreme neatness and order which prevail throughout the works, and which is rigidly insisted on. Having known these works for the last fifteen years, we particularly noticed the great change in this respect, which is entirely due to the able and energetic administration of M. Sadoine.

Altogether the works are exceedingly interesting, and if there are some points of detail in which lessons might be usefully taken from us, there are others again in which some of our manufacturers might profit by a visit to the Seraing Works.—*Engineering.*

Engineering and Mechanical Notes.

In reference to the wide diffusion of gold, *Iron* says that, a few years since, it was seriously considered whether it would not pay to reduce to powder a new prison in Melbourne, built of auriferous quartz, and erect another. Recently we hear of the streets of Maryborough, Victoria, being so resplendent with gold that their very sweepings are more valuable than the labor bestowed upon their collection and washing. From California the news comes that it is intended to raise all the auriferous sand-beds there from the sea bottom by means of diving-bells. Late papers from Victoria say that through the sinking of a post hole for a garden fence, quite a rush for marking out quartz claims has set in, in the vicinity of the Springs Hill, Maldon rifle-ground.

The use of iron as armor for forts bids fair to become a source of demand which will be not only steady but very important. It will be largely used in the new forts to be built in the German part of France. On both sides of the new fort of Privat there are building armored flank batteries, which will command the valleys of the Seille and Moselle, while two rotating iron-plated towers are intended to secure communication with the rear of Fort St. Quentin. The structures will either be shields of iron plates, such as those tried at Portsmouth, or they will consist of arched casemates, built up of large blocks of chilled iron castings, to be fitted together by grooved flanges, thus avoiding all bolts, washers and nuts, which invariably will fly off when such a structure is hit by a heavy projectile. These iron casemates, which only contain one large gun each, and are provided with embrasures, are then to be thickly covered with earth, and will be entirely shot and bomb proof, as has been shown by the extensive trials which were carried out at Tegel, near Berlin, some three years ago. After heavy firing at short ranges a shot succeeded in cracking one of the chilled blocks, which afterwards resisted all attempts at destruction, and showed that the casemate even then was as safe as ever before. A similar system of iron batteries and forts seems to be proposed for the protection of the coasts near the mouths of the Elbe and Weser.

Chemical Items.

Determination of Manganese in Cast-Irons and Steels.—One of the main causes of the loss of manganese in these determinations springs from the employment of too large an amount of acetate of soda in the previous precipitation of the iron. The author finds that in a perfectly neutral solution 1 grm. acetate of soda suffices to precipitate completely 1·1 grm. of iron in 500 c.c. of solution, and even in presence of 1 grm. of acetic acid. When the determination of the manganese alone is required, he cools the liquid, makes up its volume to 500 c.c., filters through a dry filter, and determines the manganese in 250 c.c.—*Kiesser.*

Artificial cryolite may be made by taking crude, or better, distilled hydrofluoric acid, containing 5 per cent. of anhydrous acid and half saturated with pure alumina. A solution of sodium chloride is then added until the mixture contains three equivalents of soda for one of alumina. The precipitate is artificial cryolite.

THE COAL TRADE.

NEW YORK, Oct. 9, 1873.

Business continues good, and will undoubtedly remain so for the rest of the season. As time passes on, the expectation that coal dealers would be free to a great extent from the embarrasments which affected other branches of trade, have been entirely realized. There has been a freedom from loss and delayed payments, which is due partly to the readiness with which a retailer can turn his business at one stroke from a credit one to payment on delivery, and partly to the fact that the monthly advance has covered all loss and cost to dealers from consumers who have delayed to lay in stocks.

Bituminous.

In bituminous coal the trade is lively, prices stand at $7.50; coal is coming freely through the canal, and in all respects the business presents a favorable aspect. In our report last week was an error which would be easily discovered by the initiated and would make no impression on the uninitiated. We should have quoted the Franklin Company's coal at $7.50 in New York; and Fairmount gas coal at $6.50 to $6.75, f. o. b., Baltimore, instead of "Franklin gas coal $7.25" as last week.

Though the coal companies whose headquarters are in New York have been able to pay off their men without very great trouble the companies doing business in other parts of the country have been less fortunate. A telegraphic dispatch from Youngstown, Ohio, says: "The impossibility to obtain currency by the manufacturers and coal operators of this valley to meet large pay-rolls in the present crisis has compelled them to devise some means to satisfy their employes and keep the works in operation. At a meeting held here last night it was resolved, until money is easier, to pay the employes in notes of five, ten, and twenty dollars, payable in four months at the bank with 8 per cent. interest. Any sum of less than five dollars is to be paid in currency.

Anthracite Coal Trade for 1872 and 1873.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending, 1873, Oct. 4, compared with the week ending Oct. 5, 1872.

COMPANIES.	1872. WEEK.	1872. TOTAL.	1873. WEEK.	1873. TOTAL.
Phila & Reading R.R†..	97,646	3,690,237	103,927	3,994,892
Schuylkill Canal.....	25,228	649,236	25 067	588,090
Lehigh Valley R. R. ..	60,735	2,557,252	77,087	2.720.474
Lehigh & Sus. R. R.	38,065	1.293 681	49.468	1.540,252
" " Canal	26.733	601,833	26,814	576,170
Scranton North.....	22,613	577,058	23,628	737,414
" South	31,128	1,621,292	46,640	1,641,744
Penn. Coal Co., rail.....	26,653	912.936	29,453	955.758
" " " canal....	238	4 795	..	6.561
Del. Hud C. Co. Canal	42,470	1.122,473	45.346	1,135,469
" " East...	8,575	427 5 8	9 46	322,139
" " West..	12,477	307,710	17,562	426,413
" " South.	7,321	296 912	4 402	154,321
Shamokin.....	15,189	443.767	18,601	491,899
Trevorton.....	....	....	....	....
Lykens Valley Coal Co....	....	....	....	....
Wyoming North.....	....	....	....	....
Wyoming South.....	....	....	....	....
P. N. Y. C. & R. R. Co..	13.316	483,819	17.037	597,008
Williamstown Co'y.....	....	.....	....	....
Big Lick Col....	....	.....	....	....
Total..	434,177	14,986,109	489,724	15.969.904
1872.....			434,177	14,986,409
Increase.			57,549	983.495
Decrease.....				

These figures are for the week and fiscal period commencing Nov. 20.

† Corn coal transported for Company's use and Bituminous coal.

Bituminous Coal Trade, 1872 and 1873.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending Oct. 4, 1873, compared with week ending Oct. 5, 1872.

COMPANIES.	1872. Week.	1872. Year.	1873. Week.	1873. Year.
C. & O. Canal..... ...	16,8.7	502,193	24,206	489,230
B. & O. R. R.	26,486	952,346	32,158	1,122,047
Penn. S. Line..... ..	....	.....	3.227	76,723
H. & B. T. R. R.....	6,313	224,154	10,598	341,941
*Harrisburg & D.....	10,331	373,137	7,004	257,109
*L. V. R. R....	567	23.580	412	22,760
P. & N.Y.C. & R. Co.....	6,296	289,867	5.770	244,680
{Cumberl'd Branch Canal.	4,496	169,166	5,385	101,735
{ " Railroad....	1,337	15,523	937	69,164
Total.....	72,617	2,548,969	89,655	2,725,393
	....		72.637	2,548,969
Decrease.....	....			
Increase	....		17,018	176,424

Delaware Lackawanna & Western Rail Road Company.

Coal transported on the Delaware, Lackawanna, & Western Railroad for the week ending Saturday, Oct. 4, 1873.

	WEEK. Tons. Cwt.	YEAR. Tons. Cwt.
Shipped North.....	23,528 05	737,414 08
Shipped South.....	46,640 00	1,621,243 17
	70,268 05	
Total.....		2,358,658 05
For the Corresponding time last Year :		
Shipped North..	22,632 12	577,057 19
Shipped South...	35,128 06	1,641,291 13
Total.....	57 760 18	2,198,349 12
Increase.....	12,570 07	160,308 13
Decrease.....		

Philadelphia & Reading Railroad and Branches.

COAL TONNAGE

For the Week ending Saturday, Oct. 4, 1873.

BY RAILROAD.—ANTHRACITE.

PASSING OVER MAIN LINE AND LEB. VAL. BRANCH.

	Tons.	Cwt.
From St. Clair.	36,637	13
" Port Carbon.	4,750	02
" Pottsville.	3,044	13
" Schuylkill Haven.	35,830	03
" Pine Grove.	6.519	03
" Tamaqua.	11,991	04
" Harrisburg.	19	16
" Dauphin.	5,134	03
Total	103,926	16

FOR SHIPMENT BY CANAL.

Passing Frackville Scales	7,246	05
" Mill Creek "	1,349	00
" Schuylkill Valley Scales	645	19
" Mt. Carbon "	1,899	07
" Cressona "	6,423	09
" Pine Grove "	....	....
" Tamaqua "	3,341	13
Total	20'998	13

SHIPPED WESTWARD VIA CATAWISSA AND WILLIAMSPORT BRANCH AND NORTHERN CENTRAL RAILROAD.

Via Catawissa & Williamsport Br.	379	15
" N. C. R. R. passing Locust Gap.	1,736	03
" " " Shamokin.	5,098	12
" " " Herndon.	....	....
Total	7,164	10

SHIPPED WEST OR SOUTH FROM PINE GROVE

Via Schuylkill & Susquehanna R. R.	1,088	16
" Lebanon & Pine Grove Branch	956	13
Total	2,045	09

CONSUMED ON LATERALS.

From Frackville Scales.	615	07
" Mill Creek "	181	03
" Schuylkill Valley Scales.	694	14
" Mt. Carbon "	913	01
" Cressona "	584	01
" Pine Grove "	94	06
" Tamaqua "	574	19
Total	3,662	08

LEHIGH AND WYOMING COAL.

Received via Silverbrook Junction, Sent East	10,136	13
Cat. & Wpt. Br. Sent West	....	....
" " Rupert, Cat. & Wpt Br.	130	06
" " Allentown E. Penn'a Br.	237	04
" " Alburtis, "	26	06
" " Oreland, G. & N. Br.	1,165	19
" " Willow Street R. R.	485	00
Total	12,181	07

BITUMINOUS.

rom Harrisburg.	6,974	07
" Connecting R. R., G. & N. Br.	....	....
" Junction R. R.	33	00
Total	7,004	07

COAL FOR COMPANY'S USE.

Antbracite	7,339	18
Bituminous	308	03
Total	7 648	01

RECAPITULATION.

	Total for Week.	Corres-p'g week last year.	Increase and Decrease.
Passing over Main Line and Leb. Val. Branch	103,926 16	97,686 09	i 6,240 07
For Shipment by Canal	20,998 13	24,618 04	d 3,619 11
Shipped Westward via Northern Central R. R.	7,164 10	9,865 12	d 2,701 02
Shipped West or South from Pine Grove	2,045 09	2,272 15	d 227 06
Consumed on Laterals	3,662 08	5,188 13	d 1,527 05
Lehigh and Wyoming Coal	12,181 07	2,017 12	i 10,163 15
Total Anthracite p ping freig't	149.879 03	141.519 05	i 8,359 18
Bituminous	7,004 07	10,331 19	d 3,327 12
Total of all kinds paying freig't	156,883 10	151,851 04	i 5,032 06
Coal for Company's use	7,648 01	5,915 19	i 1,732 02
Total Tonnage for Week	164,531 11	157,767 03	i 6,764 08
Previously this year	5:1228 19	4879114 00	i 301,814 19
Total to date	5345760 10	5037181 03	i 308,579 07

SHIPPED BY CANAL.

From Schuylkill Haven	21.281 07	19.815 00	i 1,466 07
" Port Clinton	3,786 00	1,796 00	i 1,990 00
Total Tonnage per Week	25.067 07	21.611 00	i 3,456 07
Previously this year	563,023 02	632,6:8 05	d 69,935 03
Total to date	588,090 09	654,269 05	d 66,178 19

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Oct. 4, and during the year 1873, compared with the corresponding period of 1872.

WEEK.

	C. & O. C'l. Tons. Cwt	B. & O. R. R. Tons. Cwt.	Pa. S. Line Tons. Cwt	Total. Tons. Cwt
1873.	24,205 16	32,158 01	3,226 19	59,190 16
1872.	16,877 07	26,485 13	....	43,362 00
Increase.	7,328 09	5,672 08	3,226 19	16,227 16
Decrease.	.....	.....	....	

YEAR.

1873.	489,230 04	1122048 16	76,725 11	1,688 002 11
1872.	502,196 01	952345 12	....	1,454,541 13
Increase.	....	169,701 04	76,725 11	233,460 15
Decrease.	12,965 17	....	....	....

Cumberland Branch R. R.

WEEK.

	To C. & O. Canal. Tons. Cwt.	To P. & O. R. R. Co. Tons. Cwt.	Total. Tons. Cwt.
1873.	5,344 14	985 08	6,370 02
1872.	4,439 17	1,336 15	5,826 12
Increase.	894 17	....	543 10
Decrease.	....	351 07	.....

YEAR.

1873.	101,735 08	69,164 01	170,899 09
1872.	169,165 12	15,522 16	184,688 07
Increase.	....	53,641 05	13,778 18
Decrease.	67,430 03		

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Susq. Div.)

Week ending Oct. 4,—Compared with same time last year

REGION SHIPPED FROM.	TIDE. tons ct.	LOCAL. tons ct.	CANAL. tons ct.	TL WEEK tons cwt.	TL. DATE tons.cwt.
Wyoming	28491 16	10649 00	3453 16	42594 12	1356961 03
Upper Lehigh.		3:41 09	911 15	3953 04	150610 04
Beaver Meadow	4261 02	2446 14	3087 12	9995 08	246320 03
Hazleton.....		464 02	7042 10	7506 12	158427 10
Mauch Chunk.	4160 19	3235 08	7388 06	14784 13	438357 13
Total.....	33913 17	20036 15	21883 19	78874 09	2349686 12
Prev'ly reported	1085 5 5 04	720557 11	4 6359 10	2269 52 13	
Total to date .	1119869 19	740594 04	183222 09	2348686 12	
Same time .1872	909625 01	656636 01	383333 11	1956599 12	
Increase	210243 18	81958 03	99864 17	392086 19	
Decrease					

DISTRIBUTION.	WEEK 1873.	WEEK 1872.	YEAR 1873	YEAR 1872.
Forwarded East by Rail to Tidal points	36913 17	26348 07	1119868 19	909925 01
Forwarded East by Rail to Local points	10650 14	11037 06	343720 10	319198 05
Forwarded East by Rail use Central Division	1753 03	1587 05	67743 16	50577 16
Forwarded East by Rail use L. & S.	148 18	98 02	9013 02	6681 17
Delivered at and above Mauch Chunk	2519 13	1675 05	61221 07	44178 15
Delivered at Coalport & Hazard for Canal	21883 19	16035 15	522310 12	430200 09
Delivered to L. V. R. R. at Packerton	216 02	277 05	18831 05	11176 05
Delivered to L. V. R. Rd at Sugar Notch	4:66 14		73965 02	
Delivered to L. & B. R. R.at Plymouth Bridge	631 10	4656 15	132106 16	175963 08
Total	78934 09	60850 00	1348686 12	1956599 13

Penn. and N. Y. R. R.—Coxton, Pa.

Coal tonnage for week ending Oct. 4, 1873.

	Week. Tons. Cwt.	Total. Tons. Cwt.
Anthracite received :		
From Lehigh Valley R. R.....	13,982 08	405,870 11
" Lack. & B. R. R.....	1,845 00	35,135 02
" Pleasant Valley R. R.....	546 06	127,004 17
" Sul. & Erie R. R.....	603 13	29,007 11
Total.....	17,067 07	597,908 01
Same time last year	13,335 14	488,859 06
Increase	3,731 13	108,146 15
Decrease		
Distributed :		
To Lehigh Valley R. R.....	19 05	24,004 13
To Lack. & B. R. R.....	4,683 05	1.443 08
To S. Central R. R.....	4,830 07	132,908 17
To Ithaca & A. R. R.....		121,387 00
To Erie R. W. Pockets for shipm't.	5,567 00	217,933 16
To Erie Railway, Watkins direct..	337 04	10,115 09
To Individuals on line of road....	781 04	24,174 02
To points at & above Coxton for use of Co.....	511 18	22,199 17
To points between Waverley and Elmira.....	337 04	40,841 02
Total.....	17,067 06	597,008 01
Bituminous received from BARCLAY R. R.		
Shipped north from Towanda.....	5,712 10	242,591 17
Shipped south from Towanda.....	12 05	1,808 01
Northern Central R. R.....	46 00	280 09
Total.....	5,770 15	244,680 07
Same time last year.....	6,296 06	289,867 10
Increase	....	
Decrease.....	525 11	45,187 03
Distributed :		
To Erie Railway.....	5,563 04	221,360 08
To So. Central R. R.....	149 06	20,691 09
To Ithaca Valley R. R.....	12 05	470 15
Lehigh Valley, R. R.....	....	984 04
To individuals on line of Railroad.	46 00	1,084 07
To points on line of road for use of Company.....	....	118 04
Total.....	5,770 15	244,680 07
Grand totals transported		
Anthracite.....	17,067 07	597,008 01
Bituminous.....	5,770 15	244,680 07
Total.....	22,738 02	841,688 08
Same time last year	19,632 00	778,726 16
Increase	3,206 02	62,961 12
Decrease	.....	

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending Oct. 4, 1873.

	1873. WEEK.	1873. YEAR.	1872. WEEK.	1872. YEAR.
By Railway.....	27,898 02	955,758 07	26,423 06	912,956 01
" Canal..... ...	1,555 13	6,561 13	233 02	4,795 16
... .	29,453 04	962,319 00	26,631 08	917,751 09
Increase, 1873..	44,567 11			

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, Oct. 4, 1873.

	WEEK.	SEASON.
By Delaware and Hudson Canal.....	45,246	1,135,469
By Railroad, East.....	9,346	322,139
" West.....	17,562	426,413
" South	4,402	154,431
Total 1873.....	76,956	2,040,452
Corresponding time in 1872 :		
By Delaware and Hudson Canal.....	42,070	1,122,073
By Railroad, East.....	8,575	427,508
" West.....	12,477	307,710
" South.....	7,321	296,912
Total.....	70,443	2,154,203
Decrease.....	213,751	

Report of Coal Transported over the Lehigh Canal

For the week ending Oct. 3, 1873.

REGIONS SHIPPED FROM.	TIDE. tons. cwt.	LOCAL tons. cwt.	TL. WEEK tons cwt.	TL. DATE tons, cwt.
Mauch Chunk Region	3,913 01	4,151 06	7,849 07	179,171 14
Mauch Chunk Region Hazardville		25 07	25 07	21,117 09
Beaver Meadow Region	691 04	4,762 04	5,453 08	164,974 08
Mahanoy Region	94 16	1,032 00	1,126 16	16,955 18
Hazleton Region	1,784 09	5,824 18	7,611 07	149,934 01
Upper Lehigh Region	99 04	683 10	782 14	22,915 09
Wyoming Region	2,521 12	1,306 10	3,929 02	77,719 02
Wyoming Region, Hazardville		58 14	58 14	4,262 09
Total,	9,309 06	18,524 09	26,833 15	576,170 01
Previously reported	193610 18	356725 08	550,338 06	—
Total to date	202920 04	362249 17	576,170 01	
Corresponding week last year	232010 07	369631 14	601,632 11	
Increase.				
Decrease	25,100 03	3?2 07	25,482 10	

DISTRIBUTION.	WEEK 1873.	WEEK 1872.	YEAR. 1873.	YEAR. 1872.
Consumed on line of Lehigh Canal	2,871 10	3,186 08	59,496 06	58,943 19
Passed into Morris Canal to Tidal Points	67 12	65 07	2,201 01	4,681 15
Passed into Morris Canal to Local Points	1,918 14	861 07	24,476 06	19,078 00
Passed into Del. & Rar. Canal to Tidal Points	8,241 14	10,301 09	264,819 03	227,339 12
Passed into Del & Rar. Canal to Local Points	227 14	93 15	10,118 15	11,816 14
Consumed on line Delaware Div. Canal	1,271 04	1,292 06	34,144 13	36,510 09
Passed through to Bristol	13,085 07	10,932 02	240 973 17	243,278 02
	26,833 15	26 732 14	576,170 01	601,632 11

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for the week ending Oct. 4, 1873, with Totals to date, compared with same time last year.

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt.
Total Wyoming	19,906 17	722,915 00
" Hazleton	51,3.9 16	1,829,773 08
" Upper Lehigh		2,363 17
" Beaver Meadow	16,215 11	537,847 10
" Mahanoy	14,272 18	426,504 03
" Mauch Chunk	75 00	3,657 06
Total	100,718 02	3,837,799 14
Same time last year	82,587 18	3,255,631 07
Increase	18,280 14	232,159 07
Decrease		
Forwarded East from Mauch Chunk by rail	72,967 09	2,720,471 07
Same time last year	60,786 16	2,587,.81 12
Increase	11,312 13	161,.22 15
Decrease		
DISTRIBUTED AS FOLLOWS.		
Local East of Mauch Chunk	1,388 02	65 311 15
Forwarded East for use L. V. R.	1,144 16	44,246 01
Delivered to Furnaces and Manufacturing Companies	11,593 09	551,735 07
Delivered to Cat & Fog R. R	186 18	5,572 11
" " East Penn R. R.	201 03	7,949 05
" " North Pennsylvania Railroad	5,149 01	208, 28 16
" " Port Del	6,546 08	170,573 14
" " East Amboy Railroad		
" " Morris and Essex Railroad	6,592 10	237,775 03
" " Bel Del Railroad	26,425 13	985,713 16
" " Central Railroad	9,248 09	457,447 17
Delivered at and above Mauch Chunk for use of L. V. R.R.	2,053 16	57,607 10
To P. & N. Y. & R. R.	13,962 18	405,870 11
To North rn Central R. R.	723 01	16,747 15
To D. H & W. R. R.	497 19	28,168 14
To L. & S. R. R. at Packerton for rail	25 19	11,845 15
To Individuals at Mauch Chunk	531 01	2,063 12
To Individuals above Mauch Chunk		11,497 16
To L. &S. R. R., at Penn Har., for railroad		1,541 10
Do. for canal	7,042 10	148,795 16
To Lehigh Canal Mauch Chunk	3,822 19	62,.23 14
To Catawissa Railroad	5 03	55 00
To L. & B. R.R. at Lack. June	25 10	69,717 14
Total	100,798 02	3,837,790 14

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Company for the week ending Saturday, Oct. 4, 1873.

	WEEK.	SEASON
North	55,422 19	2,053,.28 01
South	4,402 02	154,431 00
Total 1873	59,825 03	2,207,459 01
Corresponding time in 1872 :		
North	52,224 02	1,970,125 04
South	7 3.0 12	296,911 02
Total, 1872	59,544 14	2,267 036 12
Increase North	3,198 17	82,903 17
Decrease North		
Increase South		
Decrease South	2,918 08	143,480 08
Increase	280 09	
Decrease		59,577 11

Northern Central Railway, Shamokin Division.

Below is the return of Coal sent over the Shamokin Division of the N. C. R. W., for the 7 days ending Oct. 3, 1873.

	Tons. Cwt.	
East	3,760 08	
West	14,840 14	
		18,601 02
Same time last year		15,389 11
Increase		3,211 11
Decrease		
Total amount shipped to date		491,699 09
Same time last year		423,767 08
Increase		67,932 01
Decrease		

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

Company Coals.

Oct. 1873.

	L.	Str.	Grs.	Eg.	Sto.	Chest
Pittston at Newburgh	5 00	5 00	5 10	5 20	5 50	5 60
*Lackawana at Rondout	5 25	5 35	5 45	5 60	5 80	5 20
Wilk'b're at Pt. John's	5 00	5 15	5 25	5 40	5 60	5 05
Old Co. Lehigh at Pt. John'n	6 10	5 85	5 85	5 95	5 20	—
New York Coal Exchange	6 00	5 85	5 85	5 95	5 20	—
AT PHILADELPHIA.						
Hard White Ash	4 60	4 60	4 70	4 70	4 90	3 95
New B'rn'g White Ash Coal	4 60	4 60	4 70	4 70	4 90	3 95
Schuylkill Red Ash	— —	— —	4 70	4 85	4 15	3 95
Alaska Red Ash	— —	— —	4 70	4 70	4 90	3 95
Shamokin White Ash	— —	— —	4 80	5 00	5 10	4 10
North Franklin	— —	— —	5 10	5 10	5 00	4 00
Lorberry	— —	— —	5 35	5 55	5 35	4 35
Lykens Valley	— —	— —	— —	6 10	6 10	4 75
SHIPPED FROM ELIZABETHPORT, HOBOKEN AND TRENTON.						
L. C. and N. Co., Newport	— —	— —	5 35	5 50	5 70	5 10
" " Plymouth Red Ash	— —	— —	5 15	5 60	5 80	5 10
" " Room Run	5 85	— —	5 70	5 70	5 95	5 15
Honeybrook Lehigh	5 90	— —	5 80	5 85	5 90	5 20
Fulton, "	6 10	— —	5 85	5 85	5 95	5 20
Scranton	4 85	5 10	5 20	5 55	5 65	5 00

For freights to different points see "Freights."
*To contractors only.

Prices at Baltimore—Oct. 1873.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$6 00@6 25
Pittston and Plymouth, do	5 75@6 00
Shamokin Red or White Ash, do	6 00@6 25
*Lykens Valley Red Ash, do	@6 55
By retail, all kinds per ton of 2,240 lbs	7 50@8 50
*George's Creek and Cumberland f. o. b. at Locust Point for cargoes	4 85@5 00
West Va. and Youghigheny gas f. o. b. at L. Point	6 50
Kanawha Cannel, coarse	@12 50

* Freight to New York $2 15.

BITUMINOUS COALS.

Kittaning Coal Co.'s Phœnix Vein, f. o. b. at Phila	$
Lemon " " "	
Cumberland Vein Coal	
Tyrconnel f. o. b.	$7 00

Prices at Georgetown, D.C., and Alexandria, Va.

Oct. 1873.

George's Creek and Cumberland f. o. b. for shipping $4 60@4 75

Prices at Havre de Grace, Md.

Oct. 1873.

Wilkesbarre and other White Ash for Cargoes	$5 50@6 00
Lykens Valley	6 25@6 50
Shamokin Red or White Ash	5 75@6 00

Bituminous Coals (Cumberland).

Georgetown, F. o. b.	$4 60
Baltimore "	5 10
New York "	7 50
South Amboy "	6 50

Prices of Foreign Coals.

Oct. 1873.

Duty 75 c. per ton.

Corrected weekly by ALFRED PARMELE, No. 32 Pine street, N. Y.

Liverpool Gas Coking	—@—
" " Cannel	17 00@—
" House	20 00@22 00
" Orrel	20 00@—

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$20 00@22 00
" Cannel, "	22 00@25 00

Per ton 2,000 lbs. delivered.

Prices of Gas Coals.

Oct. 1873.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

	Coarse	Slack
Block House, f. o. b. at Cow Bay	$2 50	$1 25
Gowrie	2 00	0 00

Corrected by Bird, Perkins & Job, 27 South street.

	Coarse.	Culm of Coal.
Pictou	nett $3 00	1 50
Sydney	3 25	1 00
Lingan	2 75	1 00
Caledonia	2 75	1 25

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty on all slack coal or Culm : 40c. per ton of 28 bushels, 80 pounds to the bushel. On all bituminous coal or shale: 75 cents per ton of 28 bushels.

AMERICAN.	Nominal quo Currency.
Westmoreland f. o. b.	$6 00 @7 00
Fairmount Gas Coal Co. of N. Y. "	6 50 @7 00
Dusgard Coal Co. "	6 50 @7 50
Penn. "	6 50 @7 00
Newburg Orrel Gas. "	6 50 @7 00
West Fairmount Gas Coal "	6 50 @7 00
Redbank Cannel, at Pa "	12 00 @0 00
AT PHILADELPHIA.	
Westmoreland "	7 50 @0 00

Foreign and Provincial Freight

Oct, 1873.

Foreign.
Newcastle and Ports on Tyne, per keel of 21 1-5 tons £
Liverpool, 5 per cent primage

TO NEW YORK.

Provincial

Sydney	
Lingan	$5 00
Cow Bay	4 00
Port Caledonia	4 00
Little Glace Bay	4 00

TO BOSTON.

Sydney	4 00
Lingan	3 50
Cow Bay	3 50
Port Caledonia	3 50
Little Glace Bay	3 50

TO MONTREAL.

Caledonia	3 75 gold

TO CUBA.

Caledonia	9 50 gold.

Freights.—Oct. 1873

TO EASTERN PORTS.	Cumberland. From Georgetown.	Cumberland. From Baltimore	Anthracite. From Philad'a.	Anthracite. From Port Elizabeth, Port Johnston, Weehawken, and Hoboken.	Anthracite. From Newburgh.	Anthracite. From Rondout.
Amesbury	— —	— —		— —	— —	— —
Bangor	— —	3 50		— —	— —	— —
Bath	— —	3 00		2 10	— —	— —
Boston	3 00	3 00		2 10*	2 10	2 15
Bridgeport	2 5	2 65		1 00	— —	1 20
Bristol	— —	— —		1 40	— —	1 65
Connasset Nar'ows	3 00	— —		— —	— —	— —
Derby	— —	— —		1 25†	— —	1 40
Duxbury	2 6.	— —		— —	— —	— —
East Cambridge	— —	— —		2 05	2 10	2 15
Fall River	2 50	2 70		1 40	1 45	1 60
Hackensack	— —	— —		— —	— —	— —
Hartford	3 25	3 25		1 50	— —	1 75
Hoboken	2 15	— —		55	— —	65
Jersey City	2 15	— —		55	— —	65
Lynn	— —	— —		— —	— —	— —
Middletown	— —	— —		1 25	— —	1 40
Mystic	— —	— —		1 30	— —	1 45
New Bedford	— —	2 85		1 50	— —	1 60
Newburyport	— —	3 30		2 15	— —	2 30
New Haven	3 5.	3 5.		1 00	1 20	1 20
New London	2 50	2 70		1 20	1 30	1 35
Newport	— —	— —		1 35	1 45	1 50
New York	2 30	2 15		55	— —	65
Norwalk	— —	2 75		1 00	— —	1 20
Norwich	2 65	2 80		1 35	1 40	1 50
Pawtucket	— —	2 90		1 45‡	— —	1 60
Portland	3 00	3 00		1 90	— —	2 05
Portsmouth, N. H	3 25	3 25		2 10	— —	2 25
Providence	2 5.	2 70		1 30	1 45	1 50
Rockport	— —	— —		— —	— —	— —
Saco	— —	— —		— —	— —	— —
Sag Harbor	— —	— —		1 25	— —	— —
Salem	3 00	3 25		2 00	— —	2 15
Stamford	— —	— —		1 00	1 10	1 20
Stonington	— —	— —		1 25	— —	1 40
Taunton	— —	— —		1 85	— —	1 60
Warren	— —	— —		1 35	— —	1 50
TO RIVER PORTS						
Albany		2 60				
Catskill						
Cockzackie						
Coeyman's						
Cold Spring						
Fishkill						
Haverstraw						
Hudson		2 50				
New York vessels						
Nyack						
Poughkeepsie	2 40					
Rhinebeck						
Rondout						
Saugerties						
Sing Sing						
Stuyvesant						
Tarrytown						
Troy		2 65				
West Point						
Yonkers						

† 3 c. per bridge per ton in addition to freight.
† New Haven rate and towing 25 c. extra per ton.
‡ Towing from Providence and return, extra.
|| And towing.

St. Thomas	$— Gold
Martinique	— — "
Demerara	— — "
New Orleans	— — "
Mobile	— — "

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven Lump and St., net, $1 60; Br., Egg and Ch., $1 65; Stove, $1 75
Shipping at Pt. R., 20c., for use at Phil., $2 18 from Pt. Carbon.

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 72
C. R. R., N. J., Phillipsburgh to Elizabethport	66
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 23

MAUCH CHUNK TO FORT JOHNSTON.

L. V. R.R., or L. & S. R.R. from M. C. to Phillipsb'g	$0 72
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 16
Shipping expenses	25
Wharfage	10
Total	$2 23

TO HOBOKEN

L. V. R. R., Mauch Chunk to Phillipsburgh	72
Morris & Essex R. R. Phillipsburgh to Hoboken	6
Shipping expenses	25
Wharfage	00
Total	$2 23

TO SOUTH AMBOY.

L. V. R. R.	
R. & D. R. R.	{1}
Cam. & Am. R. R.	
Shipping Expenses	35
Total	$2 23

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	84
C. RR. of N. J. Phillipsburgh to Elizabethport	1 06
Shipping expenses	15
Wharfage	20
Total	$2 25

MARKET REVIEW.

NEW YORK, Oct. 10, 1873.

IRON—Scotch Pig is depressed, and our quotations are nominal; the late arrivals are being placed in yard, and buyers show a reluctance to enter the market except at a consiperable reduction from the present asking rates, which holders are not inclined to accept—there is no disposition to sell on time while cash offers are scarce; an invoice of 200 tons Eglinton, just to hand, will be placed in yard, excepting about fifty tons, sold before arrival, at $43; we understand the government is in the market for about 300 tons of the best brands, but the order has

not yet been filled. American Pig tends in buyers' favor, and in this description the same state of things exists as in Scotch, viz, the gradual accumulation of stocks, with little or no outlet. Rails are quiet; there are some offers for new American on long credit, which are not entertained, and some inquiry for cash, but at prices so low that manufacturers are about out of market; there are but few contracts for delivery beyond this year, and at the present there is very little doing on the spot, and scarcely anything for the future - 500 tons new, 45 lb., were sold at a private price; we quote new English $62 @$63 gold, and American $70@$75 currency, nominal; in old, we hear of nothing doing. Scrap is very quiet. Refined Bar from store is rather quiet, but firm at previous quotations. There is no doubt that very low prices have been accepted by the Mills during the last month or two, touching a figure that a little while ago was said to be the point where shipments could be made to England without loss, if not with actual process.

Import of Iron into New York, from Jan. 1 to Sept. 30, 1873—

	BAR.	PIG.	SHEET, &c.
From Foreign Ports..tons.	8,131	51,612	bdls.134,884
Coastwise.....	1,805	206	10,560
Total.....tons.	9,836	51,818	bdls.145,444
Same time, 1872..	13,736	82,388	225.419

LEAD—Since the large business in Pig, noted in our last, the market has been quiet, prices, however, remain firm. There have been some small sales at 7@7¼ cents for ordinary Foreign, and 6¾ for Domestic, all gold. Corroding Lead may be quoted 7¼@7⅜ cents gold. Bar 9¼ conts, Sheet and Pipe 10½, and Tin-lined Pipe 16½, all less 10 per cent. to the Trade.

Import of Lead into New York, from Jan. 1 to Sept. 20, 1873—

From Foreign Ports.....	pigs.222,049
Coastwise.....	36,209
Total	pigs.258,258
Same time, 1872	344,708

COPPER—New Sheathing is steady at 33 cents, and Bolts and Braziers 40, Bronze and Yellow Metal Sheathing 27, and Y. M. Bolts 32, net cash. Ingot remains very dull, and where parcels are forced on the market to realize, low prices have to be accepted in this way we note sales of 100,000 lb. Lake at 24⅜ cents; 50,000 lb. 24½; and 100,000 lb. 24, prompt cash. Holders generally are not offering stocks below 24½ cents, and for futures, deliverable late this year and during the early months of 1873, 27 cents is still asked.

REGULUS ANTIMONY—Is very quiet at about our quotations.

SPELTER—There has been no business, and prices remain entirely nominal.

Import of Spelter into New York, Jan. 1 to Sept. 30—

1873.....plates.135,712 | 1872.....plates.238,000

STEEL—There is no important feature to note, the demand is light, and the supply of English equal to the wants of the Trade.

TIN—Pig remains very dull, and the market is weak, prices gradually receding, thought still nominal in the absence of sales; Straits is held at 30½@30¾ cents, English 27⅞, Refined do. on the spot 29, and to arrive 29½, all gold. The market for Plates is also depressed, the course of prices being in buyers' favor; good brands of Charcoal Tin are held at $10 gold; sales have been made of 500 bxs. Charcoal Terne at $9.75; 50 do., 20 by 28, $21; and 200 do. Choke Terne, $7.87½ gold.

Import of Tin into New York, from Jan. 1 to Sept. 30—

	1873.	1872
PIGS	No.57,517	75,760
PLATES.....	bxs.787,748	816,196

The following is from Messrs. WHITE & HASKELL'S circular of the 4th inst.:—Pig Tin continues to be lightly dealt in, sales being made to meet wants of consumers and dealers, which are at present small. Straits is offered at 30 cents, 30 days, with sales of about 2000 slabs, here and to arrive; jobbing lots, 50@100 pigs, command 31 cents; and for arrivals due in October, November and December, large lots are offered at 30 cents, but without finding buyers at 29. English common L. & F. is offered freely at 27½ cents from store and for shipment in October and November. Refined 29½ cents from store, and 29 to arrive. English advices do not favor any improvement in price, latest cable advices quoting Straits 124s. Singapore advices show a firm market, and fair demand for China at $34,25 per picul.

	Slabs.	Tons.
Import in September, Straits.....	6,883	280
" " English.....		40
From the East Indies, there are on the way,		
Straits.....	8,417	235
Malacca.....	4,362	195

due in all October, November and December.

Stock in importers' and speculator' hands:—

	Slabs.	Tons.
Straits.....	8,417	340
English L. & F.....		26
Total, New York and Boston.....	8,417	365
Against October 1, 1872.....	7,000	310
" October 1, 1873.....	1,100	34

ZINC—Mosselmann Sheet continues steady at the Company's price from agents' hands. Manganese black oxide 4 cents, do. gray peroxide 6 cents.

Messrs. BIGELOW & JOHNSON review the market for September as follows:

NEW RAILS.

IRON—Foreign.—$63@65, gold; *American, $70@74, currency; Import at New York this month, none; previously since January 1, 41,449 tons; total to date, 41,449 tons; †same time, 1872, 154,215 tons; †same time, 1871, 164,823 tons.

STEEL—Foreign.—$109@112, gold; *American, $120@$125, currency; Import at New York this month, 7,579 tons; previousiy since January 1, 65,084 tons; total to date, 72,663 tons.

OLD RAILS.

Double Heads, $45@46, currency; T or Flange, $43@$44, currency; U or Bridge, nominal; Import at New York this month, 30 tons; previously since January 1, 9,282 tons; total to date, 9,312 tons; same time, 1872, 49,768 tons; same time, 1871, 42,781 tons.

SCRAP IRON.

No. 1 Wrought, $38@41, currency.

PIG IRON.

American Forge, $26@30, currency; No. 1 Foundry, $40@42, currency; No. 2 Foundry, $34@36, currency; Scotch No. 1 Foundry, $44@49, currency; Import of Foreign this month, 6,870 tons; previously since January 1, 44,601 tons; total to date, 51,471 tons; same time, 1872, 78,290 tons; same time, 1871, 62,075 tons.

REMARKS.

NEW RAILS.—The financial disturbances of the past month having brought business pretty nearly to a standstill, it is difficult to give accurate quotations. Without doubt, any price that might be named would be more or less nominal, as *cash* buyers would find sellers only too willing to meet them. Buyers for *notes* and *bonds* are decidedly at a discount, and their popularity is rather on the wane. It is not easy yet to predict what effect the panic will have on the price of Rails, but it cannot be otherwise than disastrous, judging by the opprobrium which is being cast upon nearly all new railway undertaking.

The sales since our last have been trifling, at about our quoted prices. In steel there is very little doing.

OLD RAILS.—The demand has been all but extinct, and, with the low prices ruling for Forge Iron, there is very little probability of any improvement.

SCRAP IRON.—Dull and nominal.

PIG IRON.—There is scarcely enough of business being done to establish a market, but No. 1 American being in comparatively light supply, maintains its position better than No. 2, which is freely offered at very irregular figures. In Scotch there was a fair business early in the month, and prices were well supported, even during the height of the money crisis. The market is now very quiet, buyers and sellers being apart in their views.

*These prices represent, as nearly as possible, the range, according to location of mill.

†These figures included steel.

Monthly Market Review.

OFFICE OF EDWARD SAMUEL,
IRON BROKER AND COMMISSION MERCHANT,
332 WALLNUT STREET.
PHILADELPHIA, October 1st, 1873.

AMERICAN PIG IRON is still without movement of note, although in the early part of the month, from the inquiries afloat, a moderately active trade was anticipated. It is needless to say that the present financial panic has entirely destroyed such anticipations. Prices are purely nominal, most of the producers preferring to carry the iron than take four months' paper, which, in the present condition of affairs, is useless. Would quote nominally for standard makes at furnace: For No. 1, $38@40; No. 2, $33@34; No. 3, $29@30—although we have heard of offerings at considerably lower figures for cash.

SCOTCH PIG is in but light stock here, and the demand confined entirely to five and ten ton lots, which have been sold at $50@51 for Eglinton. In New York, where the entire stock is in the hands of one or two parties, prices are $51@51.50 for Coltness, $50 for Gartsherrie, $47 for Summerlee and Glengarnock, and $46 for Eglinton. The last English prices, under date Liverpool, September 17th, are as follows, F. O. B. in the Clyde:

Gartsherrie.....130s.	Carnbroe.....133s.
Coltness.....132s. 6d.	Glengarnock . 125s.
Summerlee .....125s.	Dalmellington...120s.
Langloan .....125s.	Eglinton.. .....120s.
Calder..... .. ..125s.	

F. O. B. Liverpool, 7s. per ton more, all round.

Exports to the U. S. for month August.....	7,235 tons.
Exports to the U. S. for 8 months, ending August 30th.....	78,403 "
Stock of Pig Iron in store, Glasgow, 25th December, 1872	106,919 "
Stock of Pig Iron in store, Glasgow, 12th September, 1873.....	41,386 "
Decrease	65,533 "

The above figures are materially higher than those of July and August, though about 3s. per ton lower than the highest price reached during the month. The demand has been principally for the Continent, the United States taking but very little.

RAILS have been in light demand, with constantly receding figures, and the future outlook is anything but promising. Already wages have been reduced from 10 to 15 per cent. at several of the largest works, and unless a change occurs in the market, many of the mills will undoubtedly have to suspend work. American makes are held at about $75 at mills, and $65 gold is the asking price for English in New York.

OLD RAILS are exceedingly dull, with no transactions. Prices are weak, notwithstanding firmness on the other side. Double Heads are held at $49@50; T's, $45@46.

MERCHANT BARS are low in price and dull of sale. In the early part of the month orders were more plenty, the warehouse men having pretty well sold out their old stocks and desiring to replenish at the exceedingly low prices prevailing. Sales in Pittsburgh for Eastern accounts were reported as low as 2.9 cents, but the majority of orders were placed at 3 cents, at which price it is believed business can be done at present for cash. Regarding the sale of American bars in Liverpool about the middle of the month, it is undoubtedly a fact that no American iron could be sold there at the price named without heavy loss, and the transaction was no doubt for the purpose of depressing wages in that country.

WROUGHT SCRAP is in very scanty supply for prime lots, and in fair demand in small parcels. Sales were made during the month at $45 for superior selections, but about $40 for general lots is a fair quotation.

For the past five months there has been a natural and easy decline in the price of both raw and manufactured iron, which would have resulted in a healthy trade this fall or winter, had the present financial difficulties not occurred. Now, however, the outlook, barring some few specialties in manufactured iron, is uniformly depressing. The old and new railroad companies, consuming directly about 1,200,000 tons per annum, and indirectly half as much more, will necessarily be curtailed in their purchases, and this, together with the increased production, will undoubtedly produce a sluggish trade the coming winter, and perhaps require a suspension of production for some months to come. The trade generally has, however, had several prosperous years, and is perhaps in a better position to suspend operations, if needs be, than ever before. The price of labor will no doubt be materially affected, and we look forward to much lower wages for many months to come.

San Francisco Stock Market.

BY TELEGRAPH.

NEW YORK, Oct. 9, 1873.

Our advices from the San Francisco Stock Board are dated the 7th inst. With the exception of a decline in Raymond & Ely and Eureka, G. V., the market has materially advanced, Yellow Jacket notably so, being quoted $18 higher than per last report. Eureka, G. V. has declared a dividend of $3 per share, payable on the 7th instant; a dividend of $3 per share has also been declared by the Belcher Mining Company, payable on the 10th inst. The report is as follows:

			Oct. 9.
Savage	—	—	44
Crown Point	—	—	67
Yellow Jacket	—	—	12¼
Kentuck, "New Issue"	—	—	40
Chollar Potosi	—	—	12
Gould & Curry "New Issue"	—	—	67
Belcher "New Issue"	—	—	4¾
Imperial	—	—	62½
Raymond & Ely	—	—	15¾
Meadow Valley	—	—	19
Eureka G. V.	—	—	—
Ophir	—	—	—
Hale and Norcross	—	—	—

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.
JOHN A. CHURCH, E. M. Editors.

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.* It is the Organ of the American Institute of Mining Engineers, and is regularly received and read *by all the members and associates* of that large and power society, *the only one of the kind in this country.* It is therefore the best medium for advertising all kinds of machinery, tools and materials used by Engineers or their employees.

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SINCE the collapse of the reported sale of American iron in Liverpool we have cut from the American correspondence of an English paper the following summary of rumored sales. "A New York firm has received an order from Liverpool this week for one hundred tons of merchant bar iron. Two weeks ago it received a similar order from the same house for the same amount. Two firms in Pittsburg are manufacturing steel boiler-plates for customers in Ireland. A thousand tons of charcoal iron from Lake Superior have recently been shipped to England, while the importations of the metal from Great Britain to the United States have been entirely suspended for the past three months." This downright acceptance of four incorrect rumors shows how easily a story of the "four black crows" order, spreads and increases, until those who really understand the subject, make their stand against it.

THE *Mining World* brings forward a good instance of what it calls "the fitfulness of quotations." "As soon as it became known that the long-pending disputes with the Eureka, Nevada, mining company had been definitely settled, and that the Lookout mine, with its 80,000 tons of rich ore in reserve, had become the indefeasible property of the Richmond, the shares advanced to 6¾, 7; when the value of the property was further confirmed by Prof. Price, who ratified the statements of Prof. Clarence King, and when substantial dividends were commenced, the profit being equal to 30,000*l.* per month, the "market value," declined to 5¾, 6; representing an aggregate depreciation of 54,000*l.*, or 1*l.* per share." We have often said that the London stock market presented anomalies that passed the comprehension of Americans, and why mining stock should sink in value because dividends of $150,000 a month begin is a question which we think few Wall street operators could answer.

LOOK out for a "good time" at the October meeting of the Institute of Mining Engineers. The circumstances are inspiring; the inauguration of the new Scientific School building of Lafayette College will doubtless draw together a brilliant assemblage from the circles of theoretical and applied science; the locality itself is attractive, both to the lover of beauty in nature and to the student of engineering; the interval of five months which has elapsed since the Philadelphia meeting and the varied experiences of the members during that period, will enhance the social pleasure and enrich the professional fruitfulness of this reunion; and, finally, the relations with distinguished foreign societies and with a large number of foreign engineers into which the Institute has been brought through the recent sojourning abroad of several of its officers, will signalize this meeting as the commencement of a new era of increased and extended activity. We appeal earnestly to every member to be present at Easton on the 21st. But, whether present or not, let every one feel bound to contribute something to the interest and profit of the meeting. Every contribution from practical experience, whether it be an elaborate paper, or a brief communication, is welcome as a sign and means of life. No one is so badly off for experience that he cannot contribute something.

IT is with great pleasure that we announce the safe return of the Senior Editor of the JOURNAL from a brief and busy visit to the Old World. The scanty Editorial Correspondence from his pen which has appeared in our columns during his absence has hardly done more than intimate his whereabouts to our readers. But he must be forgiven for this apparent neglect, if it was really due, as he asserts, (and nobody in this concern dares to contradict him) to an almost superhuman activity, and to the impracticability of writing in European railway carriages—wofully inferior in this respect to the Pullman cars of this country, in which many an article for this Journal has been put on paper. According to Mr. RAYMOND'S story, corroborated here and there by scraps of evidence from foreign journals, and unhesitatingly believed by us, he sailed from New York immediately after returning from New Mexico, that is to say, on the 12th of July, and actively participated in the proceedings of the International Patent Congress at Vienna, in the first week of August, the British Iron and Steel Institute at Liege in Belgium, in the third week, and the meeting of Mining and Metallurgical Engineers at Vienna, in the last week, of the same month, besides the convention of German Geologists at Wiesbaden, on the 12th 13th and 14th of September—sailing from Liverpool on his return, Sept. 18th. The story is rather steep; but we give it under orders.

WE have received from Lieutenant WHEELER an indignant denial of the story that the monument set up by his party to mark an astronomical station at Georgetown, Colorado, was composed of sandstone from Maine. This story was repeated in an editorial paragraph in the ENGINEERING AND MINING JOURNAL, some months ago, with comments which we fully intended to be humorous, but which Lieutenant WHEELER, not unnaturally, finds "indecorous." His wrathful letter, being addressed to the Senior Editor, who was out of the country, and being marked "Private," has remained unnoticed hitherto, but we now hasten to announce his contradiction of our narrative and his disapprobation of our jokes. That we are not wanting in respect for Lieutenant WHEELER'S energy and ability, or the usefulness of his explorations and surveys, the files of the JOURNAL sufficiently attest. The monument story, however, was "too good to lose." Weak human nature could not have spared even a bosom friend under such provocation. The manner in which it came to us, from several independent quarters, in the form of current and uncontradicted "town-talk" in Colorado, disarmed suspicion as to its authenticity. Even now, Lieutenant WHEELER'S sweeping denial, though it moves us to immediate and frank apology, does not satisfy our curiosity. Is there no monument? Or did it not come from Maine? Or is it not of sandstone? Or do we dream, or have we dreamed till now? Or—horrid, bitter, bitter thought!—were we outrageously *sold*, by a foul conspiracy of many tongues?

Concentration and Comparison.

WE publish this week another communication from Judge BAKER, replying to our recent article on the subject of the losses by wet concentration. It is evident that if this discussion is to continue with any degree of profit to the profession it must be "concentrated" through the elimination of a good deal of "gangue" by hand-sorting, previous to publication. This preliminary operation we shall hereafter ourselves perform, having found that the method of allowing all the material furnished to go into our columns and find its natural level there, threatens to swamp the machine. Judge BAKER'S communication is published in full, because he feels, apparently, that some injustice has been done to his side—a feeling which we desire to remove, though we do not think it wholly reasonable. His intimation that we should not have "interfered" in anybody's behalf in the free fight which he understood us to have inaugurated, calls for a distinct statement from us that the sacred right of interference is one which we shall not, under any circumstances, resign. Pray, what would otherwise become of "Othello's occupation?" If Judge BAKER will overhaul the reminiscences of his own editorial career, he will find analogies enough to illustrate our grim determination to be "counted in" when the scrimmage is thickest. And as for staying the shillelagh because the foe pronounces the weapon "indecorous"—this veteran hard-hitter of the West cannot have become so demoralized as to seriously entertain such a pusillanimous notion! Faith, we are tempted to do it again, just to wake him up! But, no; we will be "decorous"; and lest this virtuous resolution should be violated by an attempt to analyze the letter which we publish this week, we leave this part of the discussion where it is, and the last word with the Judge.

The suggestion to which our correspondent takes exception as indecorous, we must, however, repeat in substance, though not, we trust, in a form offensive to him. It is our delibefate opinion that the advocates of dry concentration will be more profitably employed in perfecting their own system, and establishing by conclusive evidence its actual results, than in attempting to show that the losses in wet concentration are greater than they are. Or, to put our thought in still another form (begging our friends on that side to accept the version that seems to them most "decorous"), what we want from them, for the purpose

of comparison, is accurate evidence of what they have accomplished. We shall be able to furnish, without their aid and without fighting over RITTINGER's figures of 1867, the actual present results of the best systems of wet concentration.

We appreciate fully Mr. KROM's position, and we believe he sincerely desires and intends to furnish just such evidence in the case as engineers require. It is his misfortune (which, we hope, will not continue long to be the case) that he has no works under his control permitting a really scientific test of his method, and a free, full publication of results. The figures furnished some years ago from Colorado will not bear analysis. Those which Mr. KROM has received from the Star Cañon mill, in Nevada, are affected, we do not know to what extent, by his frank admission that the owners of that concern, "having their own objects to serve," do not favor an open investigation. We would be glad, however, to fix the value of these figures, which constitute the only promising contribution, thus far, to the present discussion; and hence we invite Mr. KROM to give us all the particulars in his possession concerning them. How were they obtained? How large a quantity of ore was treated, to obtain them? How were the samples taken? How were the different classes of products measured? If Mr. KROM (through no fault of his own) is unable to give satisfactory proof on these points, we must sadly, but inexorably, reject the evidence, and wait for better.

We have received a letter from Mr. CAZIN, which we should like to publish, because its tone is calculated to relieve the discussion of the aspect of personal strife which has unnecessarily crept into it. Mr. CAZIN disclaims the intention of a personal application of his criticisms upon Mr. KROM's pamphlet, and acknowledges the value of a practicable dry concentrator as a much-needed apparatus. He also praises Mr. KROM's advocacy of steel-faced rollers instead of stamps, and expresses a full agreement with Judge BAKER's proposition that experimental failures are not conclusive against the principle of a system, and that the causes of such failures, particularly in the West, are very numerous, and to a great extent beyond the control of the inventor. We have not space to publish Mr. CAZIN's letter in full, but we have prepared an abstract of the points which we deem important in it, and this we give in another column.

CORRESPONDENCE.

The Colorado Territorial Fair.

DENVER, October 3rd, 1873.

TO THE EDITOR: SIR—The capital of Colorado is just now crowded with visitors from all parts of this Territory and the adjoining ones. The special occasion for the gathering of such crowds is the annual fair of the Territory. The display of the agricultural products takes up, of course, the most room, and is, as it always has been on former occasions, truly astonishing to the eastern visitor; for such enormous specimens of cabbages, potatoes, sugar-beets, pumpkins, cauliflowers, savoy kale and the hundreds of other products have never been seen in such perfection east of the Missouri. The stock of horses, cattle and sheep, too, shows how earnestly the farmers of this region strive to secure for their Territory a prominent name in that respect; but I confess that I am not able to set forth the true merits of this department of the fair, and I turn, therefore, to the mineral department, which, I must say, is interesting in the highest degree. In this department Colorado has to show something new every year, and the display of the present fair, though not more than perhaps two dozen mines are represented, eclipses that of former years by far, both in regard to the beauty and intrinsic value of the ores exhibited, and in the prospective value, which a part of the exhibited specimens has for the future of the mining industry not alone in Colorado, but of the Territories adjoining it in the West, North and South. This important portion is nothing less than the first really good coke, made from Western lignites. There is a box of this on exhibition, the pieces all large, and shining, though it has only been manufactured in the retorts of the Denver gas works. It is far better than the coke I saw a year ago in Salt Lake City, made from the coal of the San Pete beds, in the southern parts of Utah; for though that was sufficiently good coke, too, for the purposes of lead and copper smelting in shaft furnaces, the pieces were nevertheless comparatively small, and retained slightly the form of the coal before coking. In this Colorado coke there is as little of the original shape of the coal visible as there is in the Connelsville coke; and if it had been made in coke ovens it would probably be as dense. The superintendent of the Denver gas works, who is an indefatigable experimenter, went to the great trouble and expense of procuring the coal from Trinidad, in Southern Colorado, where immense beds are awaiting the arrival of the narrow-gauge road to furnish the much needed cheap fuel for Western smelting works. At present these beds are 90 miles from the railroad, but it is expected that in less than two years the railroad will be extended down to them. I have been promised the results of the above experiments as to gas and coke, and shall lay them before your readers as soon as I get them.

Of gold and silver the fair furnishes splendid specimens. But besides the usual enormous ledges of gold-bearing iron and copper pyrites from Central City, Gold Hill, Boulder County, steps in this time with a display of petzite (telluride of gold and silver), and altaite (telluride of lead, containing some gold and silver) such as I have never seen before in any European cabinet; and I doubt whether the celebrated mines of Nagyag and Offenbanya have ever furnished such masses of solid tellurium ores as are here exhibited from the Red Cloud and Grey Eagle. The assays of these ores show marvellous figures, from $10,000 to $125,000 per ton; but it is of course understood that these specimens are picked, and do not represent the value of the crevice material. Still the average value of the ore in these mines is far higher than that of the common and well known gold-bearing copper and iron pyrites of the West.

Clear Creek County sends a mass weighing 2,600 lb., showing half the width of the crevice of the celebrated Pelican mine, near Georgetown. It is solid black zinc blende, and assays 505 ozs silver, or $653 to the ton. The Coldstream mine of the same vicinity sends large pieces of coarsely crystalline galena, containing $554—$664 silver per ton.

But the greatest mass in one piece is exhibited from the Moose mine on Mount Bross, in Park County. This body of mineral weighed 7 tons, when broken down in the mine, but it had to be broken up to get it out, and the largest piece, weighing 4,700 lb., was brought to Denver. It contains little gangue and shows that the body of mineral in the vein is about three feet thick. The first class ore of the mine assays about $600, second class $300, and third class $150 per ton in silver, the ore being galena with much of a cupreous silver ore, probably stromeyerite. The gangue is heavy spar and quartz.

Quite an important exhibition is that of the Las Animas mine of Boulder County. This ore is a carbonate of bismuth as determined in the Branch Mint at Denver, containing 620 ozs. of silver per ton and 23 per cent. of bismuth. This is, if I am not mistaken, the first mine in this country which furnishes bismuth in large quantities. Pitch blende, with copper pyrites, is exhibited from the Wood mine, near Central City. The mine has been regularly worked for over a year, the ore having been sold to England.

Iron ores, very pure red hematite and magnetic ore, are sent from Wyoming, and the same Territory furnishes very good black lead or plumbago, crucibles of which are also on exhibition. Besides this there is a superior quality of firebrick from the new Denver works, some excellent cases of crystallized Colorado minerals, exhibited by Prof. F. SCHIRMER of the United States Mint, and by J. ALDEN SMITH, Territorial Geologist, of Central City, and a large collection of minerals belonging to Mr. BYERS, of the Rocky Mountain *News*. A pile of 40 silver bars, the result of one month's working of the Pelican mine, and worth $52,000, as well as a large gold brick from Central City, worth $13,700, show to the visitor the reality of what is claimed for the Colorado ores.

On the whole the display of the mining department at this fair impresses the visitor with the substantial and well founded claims of Colorado to become the seat of a *permanent* mining industry, in which the precious metals will always play the most prominent role.

A. E.

A New Reagent in Amalgamation.

TO THE EDITOR—SIR: I am desirous of calling your attention to an improved method of treating gold and silver ores, either raw or roasted, by pan and barrel amalgamation. It is necessary to revert to some facts known to the metallurgist, that may help to explain the new process in question. Millmen have long been in search of some chemical as an auxiliary to aid the reduction of auriferous and argentiferous ores. Many processes have been proposed to this end, and even carried into execution. Most of them, however, have met the fate that better informed men had predicted. Others have met with more success. I here allude to the use of sub-chloride of copper, cyanide of potassium, and sodium. The first is a powerful reducing agent of the argentiferous sulphides, under favorable conditions, but its power is less marked when in contact with iron; hence the difference of results manifested by its use in the patio and pan amalgamation. There are potent reasons for this change of action. The cyanide of potassium and sodium amalgam have strong reducing qualities; their powerful deoxidizing properties render them of especial value in many metallurgical operations. Unfortunately, their cost prevents their use with low grade ores. These digressions, perhaps, may help to render intelligible the process now to be explained. This process consists in the application to pan or barrel amalgamation of the alkaline hydrated protoxide of iron. This substance has great reducing qualities. The compounds of sulphur, oxygen and chlorine with the precious metals are readily reduced by its means. Mercury is kept clean and active by its use, and its tendency to flour is prevented. This reagent is peculiarly fitted to pan amalgamation, as the excess of iron present does not lessen its value. It is economical, and the materials employed are accessible in our remotest mining districts. Those wishing to pursue the chemical bearings of this subject will be greatly aided by observing the great resemblance that exists between sulphur and oxygen in their chemical relations, and helps to explain the *rationale* of the treatment of metallic sulphides by this new agent. Any further information and technical details will be given, if so desired. JOHN TUNBRIDGE, Newark, N. J.

Concentration—Wet or Dry?

TO THE EDITOR—SIR: Since the opening of this discussion, upon your invitation, we have held ourselves ready to meet all honorable opponents of the dry system of concentration, and until the publication of Mr. CAZIN's personal attack on Mr. KROM, the controversy promised to be both courteous and profitable. That episode would have been completely closed by Mr. KROM's reply had your journal abstained from interference in Mr. CAZIN's behalf. The exigency which has brought you to his aid might have been simply amusing; but an opportunity was taken to say as follows:

"Those gentlemen who want to dress ore by the dry method had better confine their efforts to the improvement of their machinery, rather than indulge

themselves in criticising work that is about as near perfect as anything that man does in the treatment of ores."

Against this advice we protest as indecorous and unfair, insinuating, as it does, that unwarrantable criticism has been made by the friends of the dry method, when the fact is conspicuous that they have been assailed with false accusations because they had taken *all the data* of wet ore dressing from the publications of wet ore dressers. In the same editorial we are dogmatically told that "MR. CAZIN is undoubtedly right in his interpretation of Rittinger's meaning," and to prove this, it is said, "For instance, it is *nonsense* to say that the Hartz ore dressers lose anything like 30 to 60 per cent., for their losses *probably* do not exceed 9 or 10 per cent. The "nonsense" followed by "probably" does not amount to argument or proof. The Hartz ore dressers had not been mentioned in the course of the discussion, and although they may not suffer the above loss, the negative is not proved by "nonsense" and "probably." The figured illustration is so stated that no reader can verify the conclusion of the writer and must go for nothing as an argument. There is, therefore, nothing, so far, but an assertion of Mr. CAZIN's correctness, and then the following answer is made to a self-asked question: "How is it then that *any* losses occur in wet concentration?"—"One source of loss is the fact that in the earlier stages the ore is picked over, and those pieces which do not appear to have any useful mineral are thrown away, as they will not pay the cost of crushing. Some fine sprinkled ore goes with them and is lost." That is, ores which will not pay the cost of crushing are thrown away, therefore that is one source why there is "*any*" loss in wet concentration. I suppose "any" in the question was italicised so as to point out the fact which follows, viz., that the only source of loss in wet dressing occurred in not dressing ores which "will not pay the cost of crushing." We are subsequently assured, on other grounds, that the losses "are individually (in the different operations) very small, *because* the ore is operated upon "in a half dozen, perhaps in a dozen, operations." Verily, the losses should be small, very small, since "a dozen" operations must cost enough to render "any" loss a costly superfluity. This argument is then closed by another supposition as to losses sustained "of those particles which consist of half ore and half gangue" in regard to which "it is difficult to *imagine a smaller* loss than ¼ to ½ per cent.," each system of dressing being liable to this loss. When this is said the conclusion is reached—"It is, therefore, plain that the opponents of wet concentration are not fortunate in their mode of attack when they accuse it of causing undue losses of mineral." Upon this lucid conclusion the above quoted advice is given to those who want to dress ore by the dry system.

Again, Mr. CAZIN is sustained and Mr. KROM condemned—first, in regard to "poor argentiferous ores," and then, by way of showing Mr. KROM's error, the assertion is made that the "poor argentiferous ores" of Europe are very poor, and the "poor argentiferous ores" of America are by no means so poor. Has that anything to do with the question? The percentage of loss may be the same in figures, but not so the result in values. For instance, the loss of 30 per cent. on ore worth $10.50 per ton, and the loss of 30 per cent. on ore worth $25 per ton, is the same as to per cent., but very far from the same in value—viz., as $3.15 to $7.50 per ton. But the injustice of the censure is not confined to this point. An illustration of "poor argentiferous ores" is given by citing the mines of the Upper Hartz, wherein, by the showing, there is per ton 119 lb. of galena to 3 4-10 oz. silver, and 1 45 lb. copper. These ores are, therefore, poor lead ores, carrying some silver, and as such are worked for the lead. Upon such ores the percentage of loss is the smallest in wet dressing, as Mr. KÜSTEL says, but even here the losses may be 20 per cent. The "poor argentiferous ores" are not poor lead ores bearing silver, but such sulphide ores of silver which are left after selecting out all that can be selected for smelting, the poor sulphides, chlorides, &c. These selections leave the bulk of ore as "poor argentiferous ores," often 95 per cent. of the ore raised. I don't count that ore which is "too poor to pay the cost of crushing" as any part of the mass to be treated. The discussion is confined, on our side, to the concentration of this bulk of ore remaining to be treated, and which, if not concentrated, in one way or another, must also be thrown on the dump pile. It is of this bulk that RITTINGER speaks, first stating the grades of fineness as the result of stamping, and then stating the percentage of loss experienced when concentrating each of these grades. It is of this bulk that KÜSTEL says, "It is quite proper to calculate on a loss of 35 per cent.;" it is of this bulk your Journal (July 22d page 57), stated that "some silver ores involve ruinous losses by the wet method," and it is upon this bulk that the dry method reduces the loss from 35 per cent. down to 10 or 15 per cent.

The mines of the Upper Hartz, as quoted, furnish no high standard of success in wet concentration, if the figures are correctly given. By these we learn that of 13,546 tons of concentrations there were only 8,464 tons of mineral which is still mixed with 5,082 tons of gangue! Certainly, after "a half-dozen or a dozen operations" a cleaner result should be arrived at than this, especially when a breathing spell (deficiency of water) of a whole summer is had before the last touch is given, or the last of a dozen operations makes the thing "about as near perfect as anything that man does in the treatment of ores!" Of this citation it may be remarked, while not one figure is given of the amount actually lost by the wet method practiced on ores worth only 36 cts. in copper, $3.91 in silver, and .23 in lead, ($10.50) per ton, as shown by the concentrations, that if ores so or can be made to pay mining, hauling, handling, "a dozen operations" in wet centration, and the cost of after reduction and separation, a dry method which uces "a dozen operations" to one operation, with a medium abundant in all mates throughout the whole year, and saves closer, would be very much more profitable as well as less cumbrous. But we have this kind of a statement as to the loss: "A large part of the mineral consists of massive galena and pyrites, which is recovered without crushing it finer than one inch to ¼ inch diameter. When these sizes have been treated, the *loss being really insignificant*, the impoverished ore, having had more than half its useful mineral removed from it, is crushed to smaller sizes and THE HIGH LOSSES NOW BEGIN." Now, if "half its useful mineral consists of massive galena and pyrites," that half is *not* "poor argentiferous ore," and is therefore not the ore in question; nor is it that ore spoken of by RITTINGER; nor is it that "poor argentiferous ore" meant by Mr. KROM; but, for the ore really in question, we have the admission—"And now the high losses begin." This is the point, and it is here that we pin the water dressers to the fearful losses from 35 to 60 or 70 per cent., according to the grades of crushing For the purpose of this controversy it should be clearly understood that the wet dressers must hereafter abandon the sophistry contained in the following from the same editorial: "By examining the course of the operations, it will not be difficult to understand how losses can be very great in some operations and yet quite minute *when calculated* upon *the whole ore!*"

The sophistry is this: the water dressers insist upon distributing the loss by water dressing upon *all* the ore raised, although a part is rich enough to be hand-selected out, the balance being crushed fine and concentrated by several wet operations. Now, the part selected out by hand is not "poor argentiferous ores," and the losses in concentrating the latter have no relation to the former part of the ore, but must be confined to that part only of which the editorial says, "Now the high losses begin." It is true that we can also use such a method of calculation, but we have entirely too strong a foundation to resort to any such subterfuge to sustain the favorable nature of our results on just such ores, of which it is admitted, "now the high losses begin."

I do not care to waste time in lamenting the deficiency of a scientific nomenclature touching the grades of ore. When I see those educated in water dressing so completely befogged by their own figuring, extolling the great teacher, RITTINGER, when it suits, and totally ignoring his calculations and statements when they do not suit the purpose in hand, I do not anticipate any benefit from a more correct nomenclature applicable merely to the definition of the different sizes. The public do not care whether you are right in calling these sizes "gravel," "corn," "sand," "flour," "dust," or whether Mr. CAZIN's intelligible nomenclature is used—"resulting quick flour" and "middle slow flour." What is wanted, and would be very much better, may be very briefly summed up—a clear, unbiassed statement of the actual losses sustained when treating a given quantity (not that ore which is first selected out, or that ore which is thrown upon the dump "as too poor to pay the cost of crushing") of ore, accompanied with an intelligent report of the practical results obtained by the competing systems of ore dressing.

G. W. BAKER.

NEW YORK, Sept. 24, 1873.

[EDITORIAL ABSTRACT OF A LETTER FROM F. CAZIN, M. E.]

IN reply to Judge BAKER's assertion (Sept. 9th) that water admits of but 100 impulses per minute, Mr. C. says that in his jig, the plunger makes for material of ¼ to ½ mm. diameter, 160 lifts per minute, and claims, moreover, that the result and not the number of impulses is the measure of effectiveness. Judge BAKER's second proposition, that in water subsidence is delayed, he admits to be true, but denies the inference, asserting that the interchange of particles in a vertical line is controllable in the water-jig by regulation of lift and speed of the plunger. To Judge BAKER's third proposition, he replies, that it is unintelligible, since without a flow of air in some direction the air-jig could not operate at all. To the fourth proposition, namely, that the denser medium must carry off under similar circumstances of flow, more material than the less dense, and hence, if the flow of the air were the same as the flow of the water, the former would carry off less than the latter, Mr. CAZIN says, that the adhesion of small dry particles of metal to pieces of gangue, the acknowledged use of exhaustors to remove the dust, and the acknowledged loss of the whole of such dust, seem to leave the case decidedly against dry concentration; but he admits that this is a matter for decision by practical, comparative test. In the absence of any immediate prospect of such a test, under conditions thoroughly satisfactory to engineers, Mr. CAZIN forwards to us a sample of galena concentrate, ½ mm. diameter, which has been separated upon one of his continuous, one-plunger jigs, without the assistance of any other contrivance. Of this he says, "There is no foreign material in it at all; and the tailings are absolutely free of galena. But not only has the galena been separated, but blende and fluor-spar have been separated in the same operation with the same apparatus, without any other assistance than the sizing by a screen. I am ready and willing to prove and show this operation to anybody sufficiently interested in the matter to visit the works at Rose Clare, Hardin Co., Ill." Furthermore, he claims, that RITTINGER's estimates of loss would have been much reduced had he considered machines of this character, which greatly simplify and reduce the manipulations of wet concentration.

[NOTE BY THE EDITOR.—The figures which have been quoted from RITTINGER by KÜSTEL and others, distinctly refer to treatment upon *Herden*, that is, buddles and percussion-tables. The great advance of the art, since the publication of RITTINGER's first volume, has included the extension of the applications of the jig-principle to the smaller sizes of material. We do not doubt that by this improvement the effectiveness of concentration has been increased, though not, in our opinion, to the degree of a complete and absolute separation at a single operation by a single machine. Mr. CAZIN's samples have not yet arrived; when we receive them, we shall be glad to show them to parties interested.]

The Tellurium and Bismuth Ores of Boulder County.

ON May 22, 1872, the Red Cloud lode, upon Gold Hill, was discovered by CHRIS. HOLK and his partners. Specimens of the ore, whose character was unknown, found their way to the mint, at Denver, and for some time puzzled the gentlemen of that institution, who were not expecting the rare mineral for which the mine is now famous. One of the lumps that were sent for assay was broken, and one-half placed on the coals of the laboratory furnace. When it came out it was found to be dotted with little globules of native silver, reduced by the heat. Subsequent investigations upon other pieces of the ore determined that the vein carried petzite in unusually large quantities, a very rare mineral, there being but four other localities in the world known to produce it, and but one other in the United States.

Tellurium, the metal found in Petzite, is not remarkably scarce, though sufficiently so to carry a value of $200 per pound when in a pure condition. It is found in a number of combinations, and also native. In the latter case it is almost always combined with from five to ten per cent. of iron and a small quantity of gold. When free from these impurities, and untarnished, Tellurium is a steel-white metal, brittle, and easily melted, weighing a little less than iron, and having a degree of hardness about equal to that of rock salt. Its principal combinations are with lead, bismuth, gold and silver, and it is with the two latter that it has been found in the Red Cloud lode, the proportions varying in different specimens to a considerable extent, especially as regards the quantities of gold and silver, occasioning a number of telluric minerals, all of which are popularly known under the name of tellurides.

Outside the Red Cloud, this ore is found in a number of other mines upon Gold Hill and Sugar Loaf Mountain. The search for it has led to the discovery of other valuable veins, and the re-opening of many that were abandoned a decade ago. Although the "telluride belt," so much talked of by the Boulder County prospector and miner, is not yet a well-defined area, it already embraces a number of valuable lodes carrying more or less of the rich mineral, and it will probably be enlarged hereafter by the discovery of others of as good a character.

During July of the present year bismuth was found in the Las Animas mine, upon Sugar Loaf Mountain, since when a new excitement has broken out among the prospectors of Four Mile, and the search for the ore has resulted in the location of several lodes reported to carry the same mineral. Present developments will not warrant glowing predictions of the future possibilities of these lodes, for as yet not enough has been done upon them to show whether the deposits are accidental, or can be relied upon to furnish an ore, either of bismuth or of the more precious metals.

Bismuth, unlike tellurium, is not a rare metal. It is found in many parts of Europe and America, and has been noticed as nuggets in more than one placer claim in Colorado. Previous to the discovery in the Las Animas lode, we believe no bismuth had been taken from any vein in the Territory. Generally, it occurs native, and in connection with sulphur, tellurium, silica, and in an oxidized condition. The pure metal is white, with a reddish tinge, which is very distinctive. It is heavier than iron and of the same hardness as tellurium, and on account of the many uses to which it is put in the arts, is worth $5 per pound, or one quarter the value of silver. In the Sugar Loaf mines it occurs native, and in combination with sulphur and tellurium, the ore carrying also a paying percentage of silver; the ores of the precious metal, however, are not chemically united with the bismuth, as they are with copper or lead, in gray copper or galena.

It is not improbable that before many years, bismuth may be produced in considerable quantities in Boulder County, and other parts of the Territory. The fact that it has been found in the gulches as nuggets, proves its existence in veins, and the general mineral characteristics of Clear Creek, western Summit, and eastern Lake Counties, are such that the metal is likely to be found as soon as the ores are examined for anything else than gold and silver.

The discovery of tellurium and bismuth in Boulder County has exercised a great influence upon her mining industry. Eighteen months ago Gold Hill, Sugar Loaf, Four Mile Creek, and almost the whole eastern half of the county was deserted. Now it is a busy bustling camp from the crest of the range down to within a few miles of the plains. The production of the county last year was $346,540, and for the first half of the present year $357,710, a gain of over 100 per cent., which may be expected to be further increased by the yield of the remaining months of 1873.—*Mining Review.*

The Büttgenbach Furnace.

Mr. BÜTTGENBACH answers, in *Engineering*, some of the strictures made on his furnace at the Liege meeting, and also by the *Engineer*. Although American practice has secured by other means some of the advantages presented by Mr. BÜTTGENBACH'S invention, his remarks will be found interesting to some iron makers. He says:

On the occasion of the discussion of my paper at Liege, it was impossible for me to answer thoroughly to the objections made by the members of the Institute, firstly, for want of time, and secondly, for want of sufficient knowledge of the English language. But having now the reports before me, and encouraged by the interest taken by the English press in my system, I think it due to those who have been present at the meeting, and to the readers of the papers, that I should reply to the various objections raised.

1. To the objection offered by one speaker that he did not consider the brick-work of the base practical, and that the use of cast-iron columns is to be preferred, I have to answer that this cannot be an objection to the system as such. I exhibited my model with a base of cast-iron pillars, and with a base of brick-work. My experience shows, however, that a base of red bricks is entirely sufficient, and leaves room enough round the blast furnace to allow of even the most difficult repairs without opposing the slightest obstacle. I, for my part, would never allow a base to be made of cast-iron pillars, the cost of the latter being four or five times that of brick-work or masonry base, and the last entirely fulfilling the desired purpose. The adoption of brick-work or cast-iron for the base is therefore only a question of economy. The base of brick-work contains 100 cubic metres, while it cost at the Neusser Works only 1,300 francs, and could be constructed in fifteen days.

2. A second objection raised was that a blast furnace of the thickness of only one brick would not resist the pressure of the materials in large furnaces like those of Cleveland. I think that quite a false idea exists of this pressure. This pressure is not at all a great one, being partly paralyzed by the state of the minerals, which, by the heat, are caused to adhere more or less together with the coke, without, however, being in a state of semi-fusion or vitrified. I have taken away a good part of the bricks of the stack, several metres above the largest section of a blast furnace, but the mixture remained in the furnace, and allowed me to replace the bricks I had taken away without the slightest difficulty. On this occasion I remarked that the bricks had not even lost 3 centimeres after a campaign of seven years. For the rest, as supporting what I have said above, I must state that an establishment which adopted my system, made, contrary to my advice, the first blast furnace with a base of cast-iron pillars, and after a few years experience a second blast furnace at the same works was constructed with a base of brick-work.

3. Next it has been asserted that there are in Cleveland and the North of England blast furnaces with free-standing shafts. I have been over that part of England, and I have not seen *one* blast furnace where the shaft had a thickness of only one brick; they have all inside a circle of large special bricks, surrounded by a mantle of brick-work, often thicker than the lining. In my furnace the single thickness of bricks is freely exposed to the air, and dilatation by heat being prevented, I am enabled to have a furnace without hoops.

4. One opponent admits that my arrangement preserves the boshes against the attacks of the fire, but it is said that one could as well repair blast furnaces such as those in Middlesbrough, which have a lining and a mantle round this of 3 ft. or 4 ft. thickness. I do not deny that repairs are possible in the latter case, but certainly they are expensive, very difficult, and want much time; every practical man knows that, as soon as one must go below, say 30 ft. from the mouth, this gets a difficult work, the more so as the mantle hides the defects of the lining, and one does not know the state of the latter. With an entirely free shaft, on the other hand, one can perfectly well ascertain at any time the state of the bricks, and can easily make repairs, keeping the blast furnace filled. I think this is a great advantage.

5. It was said that the three series of tuyeres in my furnace were of no use, and that if, in case of accident, the blast furnace had to be blown at the height of the upper series, it would be easy to pierce the bricks to make room for a tuyere. But the three series of tuyeres are not placed there to supply the blast at three levels. The two upper series serve only to prevent the heat consuming the bricks, and to be used temporarily in case of an accident, when a regular tuyere is choked or smelted up. This happens very often in *our* districts, and I remember that I saw at some Middlesbrough works some workmen make heavy efforts to clean a tuyere. After all, I have never to take away any of the tuyeres for leakage. I consider the conservation of the primitive form of a blast furnace very important. Experience has shown the utility of this arrangement, and I do not put it here merely as a theory.

6. It was affirmed, too, that a claim for a longer duration of these furnaces could not be sustained, as there were ordinary blast furnaces in Cleveland which had been in blast eleven and twelve years. I have to reply to this that that district smelts exceptional mineral, which does not attack the blast furnaces. The ore is calcined, and put into the furnace in pieces, always very dry. The Cleveland minerals, moreover, do not contain manganese, and for these reasons they do not attack the bricks of the blast furnace as they do in the Ruhr Basin, where the ores contain 20 per cent. of water, and 20 per cent of manganese, while two-thirds of them pass a sieve of holes of 0.5 centimetre diameter. Would the blast furnaces of Cleveland endure twelve years with such minerals?

7. It was stated that scaffolding does not occur, or *ought* to not occur, with very hot blast, and especially not where Whitwell's apparatus is employed. I am an advocate of high blast temperatures, and especially of Whitwell's excellent stoves; but it is not the great heat of the blast which prevents these scaffoldings; these depend upon the quality of the mineral, and the coke of the district. I could name works in Luxembourg where the blast is heated by Whitwell's stoves, but where, with the small mineral to which I have referred, such dangerous scaffoldings have occurred in a new blast furnace that they feared to be forced to blow it out. If at the moment of crisis they had had tuyeres available 3 metres higher up, they could easily have got over the difficulty, the more so as they had very hot blast.

8. As to the way of conducting the gas, one must not forget that with mineral containing 20 per cent. of water, and of which two-thirds is small, one has to take precautions quite different to those taken in Cleveland, where, though the ore is in lump, I have seen gas pipes, of 3 ft. in diameter, full of top dust, and which were cleaned with the utmost difficulty. All these difficulties disap-

pear in my arrangement, and especially all explosions are without any effect—a very important matter when one has to do with wet minerals.

En résumé, all the objections made concern the Middlesbrough district only, but out of this there exist others, too; we, and many other works, work with mineral of which two-thirds pass into a sieve of 10 holes per square inch, containing 20 per cent. of water, and which cannot support any calcining, as getting too easily to powder. Under such circumstances, the Cleveland iron masters would not have constructed blast furnaces 85 ft. to 90 ft. in height, and would have had to take other precautions than they have, to avoid stoppings every week, to manage the difficult cleaning of their gas pipes, which would soon have been filled with dust. With materials as used in our district, where we use 20 different minerals always varying, and where coke contains as much as 18 per cent. of cinder, a blast furnace cannot be so regular, or be so easily managed as at Middlesbrough, and there very often happen disturbances in the smelting process. The corrosive nature of the mineral containing manganese rapidly attacks the bricks of the blast furnace, in consequence of which one makes everywhere preparations to prevent that, and I believe that the three series of tuyeres is the best preservative; for the rest, experience proves it. The Middlesbrough blast furnaces endure, it is said, 10 to 13 years, but certainly they would not do so under the conditions we have to meet here. My blast furnace was erected in 1865, and its condition is still such that one will readily admit the almost certainty of its lasting out double or three times its present age.

Altogether, I find that the observations made by the English ironmasters who condemn my system are too partial, the statements made reading as if the Cleveland district was the only district to be provided with furnaces, and as if the conditions which exist there, also existed everywhere. This, however, as I have shown, is very far from being the case. Even for the Cleveland district I think there are some advantages in my system which would be valuable; at least an eight years' experience of my furnace suggests this view to me. I may add, too, that seventeen of my furnaces have already been constructed on the Continent, and are all at work under almost entirely different conditions. I think this letter is a sufficient reply to the sharp criticism of *The Engineer*, to which I do not want to reply in detail, not being disposed to enter into polemics with a writer who makes inaccurate statements, and then founds arguments on them. I did not put up my system as a new invention in every particular of its arrangements, but as a total arrangement it *is new*. As such it has been acknowledged by authorities, including the owners of the seventeen blast furnaces built on my system, who certainly know "what there is new under the sun," as well as the writer of the article above referred to.

Many English ironmasters looked upon my system from quite a different point of view after having seen the furnace at work. I refer here only to the reports of Prof. JORDAN in the *Revue de l' Exposition*, 1867, which makes short work with the writer of the long article in *The Engineer*.

MINING SUMMARY.

California.

WE are indebted to the *Mining and Scientific Press* of Sept 27, for the following compilation of California mining items:

ALPINE COUNTY.

SILVER MOUNTAIN.—Alpine *Miner*: Mr. Chalmers is working ore from the Silver Mountain Mines, and is doing so well as to be entirely satisfied. The Pennsylvania is looking splendidly. We sincerely congratulate our Silver Mountain friends on the present cheering prospects.

THE SCHENECTADY MILL is again in operation. Mr. Hunter is making another run, using some of the rubbish ore from the upper dump, which has heretofore been pronounced unfit for working with present appliances. Mr. Hunter's former experiments with low grade ores have convinced him that a fair percentage of the precious metals can be saved by his process of wet, or raw crushing, and that the balance can be concentrated so as to materially lessen the expense of chlorination by furnace.

SILVER GLANCE.—In this mine the face of the west drift in the lower or main tunnel continues to show seams and crevices filled with sulphurets. On Thursday the miners struck a large vein of water, which continues to flow a steady stream. In a few days the new hoisting works will be in operation, when the downward movement from the bottom of the 100-foot shaft will be resumed. The last installment of machinery pertaining to the new steam hoisting works of the Silver Glance mine arrived on Friday. It consisted of steam pump for shaft, steam pipe, couplings and other fixtures. Men are already engaged in putting the pump and pipe in position. Everything about the Silver Glance works is assuming a lively and business-like appearance. Important surface improvements have been made already, and others are in contemplation.

AMADOR COUNTY.

Sutter Creek *Independent* September 18: A few days since the workmen on the 600-ft. level in the Mahoney Quartz mine found a very thick lead of ore about 7 ft. thick. It lies on the west of what is known as the main ledge and the richest part of the ribbon rock is next to the hanging wall and is exceedingly clear and firm. Free gold can be seen all through the rock with the eye. Next to the foot wall a very heavy body of fine sulphurets is found, and altogether no discovery has yet been made that gives such flattering prospects as this one in the Mahoney.

The consolidated Amador Mining Company after a run of two weeks cleaned up about $16,000. In this clean up only the plates were disturbed, and the mill did not stop five hours. The rock now being crushed is improving in richness and at the next regular monthly cleaning they expect to increase their figures several thousand dollars

THE HOOPER.—Nothing but the best of reports come from our mining interests. The Hooper is working a full force and is taking out large quantities of the precious metal. Several quartz mines are being opened hereabouts, and it is expected that by Fall several will be running.

Amador *Ledger*, Sept. 19: Reports from various parts of the country are very favorable in regard to our quartz interests. Developed mines are yielding very flattering returns, and indications and new developments are valuable to a long run of prosperity. The Kennedy mine, near Jackson, never presented a more favorable appearance than at present. The new ledge recently discovered at a perpendicular depth of 400 ft. is daily proving to be of great value, the ledge being from 10 to 12 ft. in width, the rock well filled with free gold and rich sulphurets, and will yield $35 per ton by ordinary mill process. The work done since the discovery proves the recently discovered ledge to be the main one of the mine, heretofore unknown to the owners. Evidently the new vein will reach to the surface, a distance of 800 ft. from the depth at which it was struck, following the incline peculiar to other veins of this mine. This alone will afford rock sufficient to keep the mill running for years to come. From all appearances, this discovery in the Kennedy is likely to prove the most valuable ever made in the county.

THE ONEIDA.—We are pleased to note the fact that a large vein of very valuable ore has been recently struck in the Oneida, permanent in appearance, and which will add largely to the gold yield of this valuable mine.

BUTTE COUNTY.

The Marysville *Appeal* of Thursday has the following item: Some time ago a cinnabar mine was discovered in the hills west of Colusa, not far distant from Wilbur's Sulphur Springs. The ore was tested by the company organized to work it, and it has been found to be rich. Two iron retorts were ordered made at the Empire Foundry in this city, about three months ago, and cinnabar was reduced, and the value of the mine by the result was further confirmed. The works are in charge of Superintendent Caswell, and on Tuesday he ordered two additional retorts, which are to be finished up with the necessary casings as speedily as possible. The company have a rich and extensive quicksilver mine, though they proceed economically by making the mine develop itself, as all expenses of working and for additional machinery are paid for by the products of the two retorts in operation. In a few years an extensive and very profitable quicksilver mine will be in operation on the site of these experimental works.

The new quartz mill for the Gold Tunnel mine near Grass Valley has been completed. It is to be run by water-power, and will not commence operations until the rainy season sets in; meanwhile rock from the mine is accumulating on the dumps.

The Grass Valley *Union* states that a company of miners under the name of the White Oak Company, have been engaged for some time past in working a ledge in the vicinity of Allison Ranch, supposed to be an extension of the North Star mine. They have sunk a shaft 150 feet on the ledge, the rock taken from which has paid, we are informed, nearly $100 per load.

Lockwood & Co. have located a first extension of the North Star ledge. The quartz taken from the new shaft of the North Star mine is said to be very rich, and the locators have a prospect ahead of a very good paying claim.

CALAVERAS COUNTY.

Calaveras *Chronicle*, Sept. 20: We have lately received samples of lignite from the Lancha Plana coal fields that compare well with the best productions of the Diablo mines. The coal sent us recently is of a much better quality than the first samples we received, the result reached by arriving at a greater depth upon the stratum. We are not informed how far below the surface the incline has been driven, but labor is being incessantly prosecuted. There is no longer a doubt but that the Lancha Plana fields will prove permanent and valuable. Prospecting enough has already been done to prove that coal exists there in inexhaustible quantities and of a better quality than is found elsewhere on the coast. We hear that the Central Pacific Company is negotiating for the purchase of a portion of the fields with a view to extracting coal for use upon their various roads. Should they be successful in their negotiations, development will follow that will give fresh impetus to every branch of producing industry in the section in which the fields are situated. As yet we have not had time to practically test the samples sent us, but will do so and give the result in our next issue.

We understand that a large force of Chinamen is employed cleaning out the Water Company's ditch, between its head and Campo Seco. The sediment from the hydraulics above has settled in the ditch to such an extent as to materially lessen its carrying capacity. As there is but a very small quantity of water at present, and nearly all the claims are laid over until the rain sets in, advantage is being taken of the opportunity to put the ditch in good repair.

Mr. C. J. Garland, proprietor of the Good Hope quartz mine, at Mosquito Gulch, is building a new mill. The battery will contain eighteen stamps, and when completed will be one of the most substantial and effective pieces of machinery, of a similar character, in the county. The mill is to stand on the site of the old one, but everything except the engine will be entirely new. About 30 men are now employed in putting up the machinery, which will be in readiness for operations in a few days.

EL DORADO COUNTY.

About 2 years ago some parties commenced sinking a shaft a little to the east of what is generally known as the "Mother Ledge," on top of the hill south of Ollis' old blacksmith shop. At a depth of 50 feet they drifted south on the ledge and took out rock that milled $24 per ton. At a depth of 70 ft. the shaft had to be abandoned on account of bad air. About this time the claim fell into the hands of its present owners, Messrs. Mitchell and Holloway, who, nothing daunted, commenced running a tunnel to strike the chimney, on which the shaft was sunk, at a depth of about 120 feet. They have run their tunnel in 260 ft., and have struck a splendid body of ore. The "hanging" or east wall is slate, and as smooth and well defined as could be wished. The rock resembles that of the old Pacific. We congratulate Messrs. Mitchell & Holloway on their present prospects, and hope soon to be able to give a still better report of their mine.

NEVADA COUNTY.

THE WYOMING MINE.—Nevada *Transcript*, Sept 19: This mine, situated near by, which is owned by San Francisco parties, is being put in thorough working order by Mr. Purinton, Superintendent. The company have erected hoisting works, formerly used by the Mt. Auburn Company, on Ragan Flat. An incline about 500 feet is to be put down as soon as water can be brought to the hoisting works to raise steam. The prospects from the ledge of the Wyoming are very encouraging. At a depth of 80 ft. where they struck water, the ledge was three feet thick, and showed very rich in free gold and sulphurets. Several boxes of the rock were sent to San Francisco, and the owners being satisfied with the result, made a contract with J. C. Abbott to move the hoisting works and place them in their present position, which he has done to the satisfaction of the company. A new mill is to be built in the spring, by which time, under

the superintendence of Mr. Purinton, the incline will have been sunk, and a large force of men will be employed in taking out rock.

CANADA HILL.—We made an item a short time since, of a very promising ledge having been discovered on Canada Hill, by Mike Enright. Since that time thirty tons of rock have been taken out by two men, and a crushing is now being had at the Oriental mill, on Deer creek.

TUOLUMNE COUNTY.

Tuolumne *Independent*, Sept. 20: Bully Littlefield discovered, week before last, a vein of gold and silver above the upper reservoir. The croppings show a width of 10 inches and in sinking upon it, is in appearance a roof-shaped formation—widening out at a depth of 2 ft. very extensively. An assay has been made of near $30 in silver and $20 in gold. Capt. Doudle, formerly of American Camp, recently discovered a monster quartz vein measuring 40 ft. wide, near the New Ditch tunnel and south and middle fork of the Stanislaus. The rock is of a greyish color and carries gold and sulphurets. Mr. Sevening, of Columbia, made an assay of $25.50 to the ton. Capt. Doudle and Jersey Dunster have located the vein.

American Institute of Mining Engineers.

OFFICIAL BULLETIN.

Announcements to Members and Associates.

I. The ENGINEERING AND MINING JOURNAL, which is the Organ of the Institute, and contains its proceedings, transactions and notices of meetings, will be sent to each Member and Associate on the payment of his annual dues. Back numbers cannot, as a rule, be sent.

II. Dues are payable in advance at the annual (May) meeting. Remittances should be made, as far as possible, by P. O. Order, payable to the Secretary.

III. The first volume of Transactions of the Institute is in course of preparation and will be sent, as soon as issued, to all members not in arrears.

IV. The regular October meeting of the Institute will be held in Easton, Pa., on Tuesday, October 21st, beginning at 7 o'clock P. M. Authors of papers are requested to notify the Secretary in advance of the subject and length of their papers.

Members will rendezvous at the United States Hotel.

WM. FIRM-TONE,
J. C. KENT,
J. M. SILLIMAN,
Local Committee of Arrangements.

THOMAS M. DROWN, Secretary.
1123 Girard street, Philadelphia, Pa.

MISCELLANEOUS.

World Exposition,
VIENNA, 1873.

The Council of Presidents of the International Jury awarded only *Ten Honorary Diplomas* (the highest distinction) to the German Empire for the Class, Construction of Machines.

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Formerly Sievers & Co., in Kalk, near Deutz am Rhine, for their efficiency in the

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But especially for their

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The qualities of which were not even approximately equalled by those of other competitors.

3t

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A Fresh Work on Mining.

SILVER AND GOLD,

An Account of the Mining and Metallurgical Industry of the United States, with reference chiefly to the Precious Metals. By R. W. RAYMOND, PH. D., U. S. Commissioner of Mining Statistics, President of the Am. Inst. of Mining Engineers, Editor of *Engineering and Mining Journal*, Author of "Mines of the West," "American Mines and Mining," "Mines, Hills and Furnaces," etc., etc.

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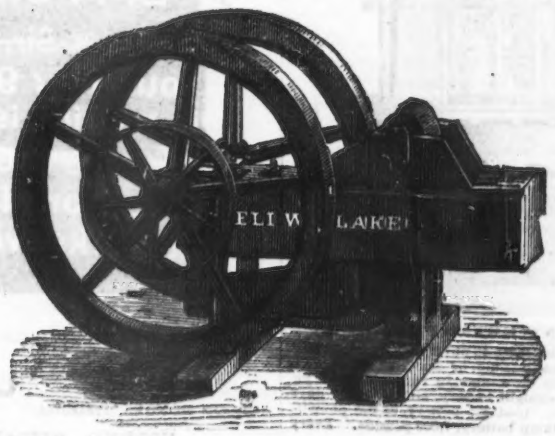
MISCELLANEOUS.

BLAKE'S STONE AND ORE BREAKER.



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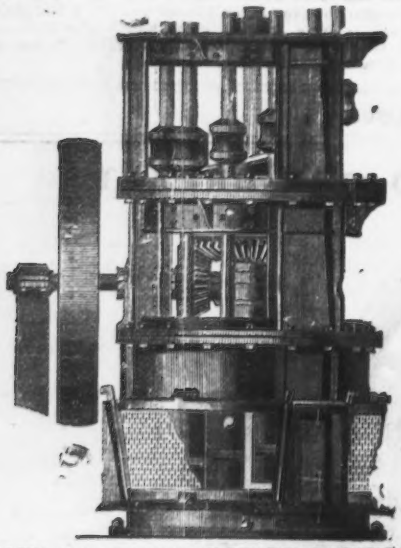

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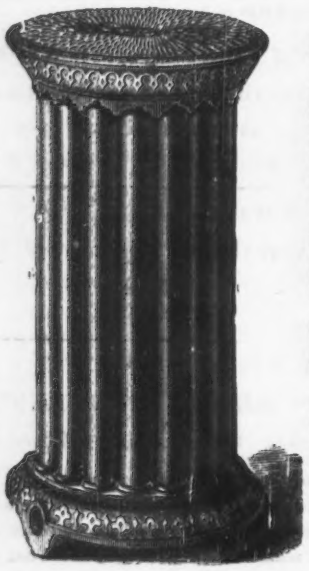

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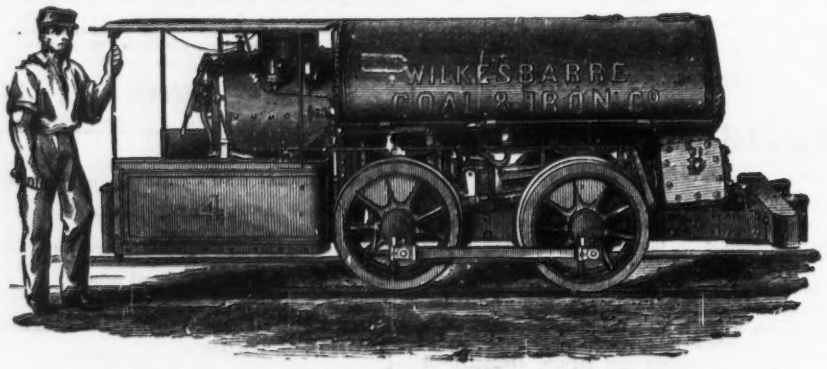

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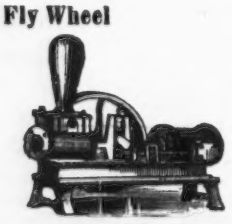

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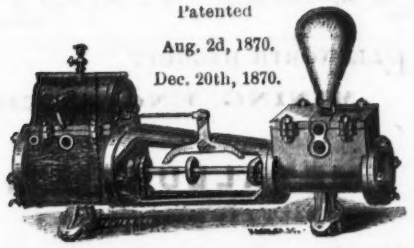

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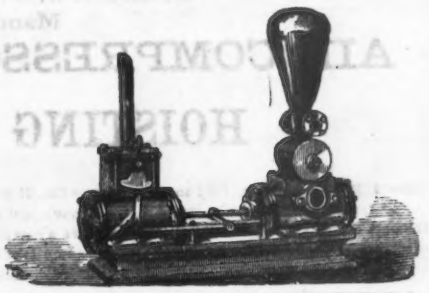

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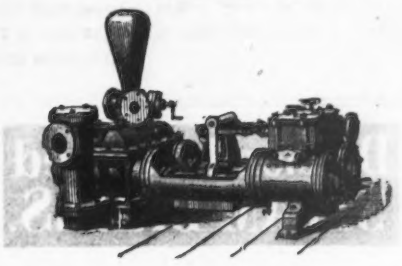

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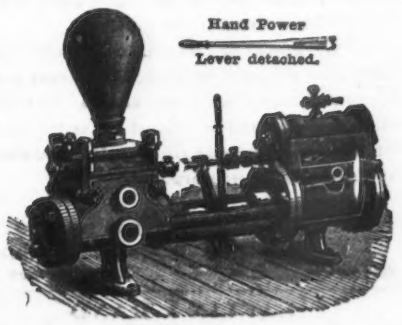

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Nov. 19:1y

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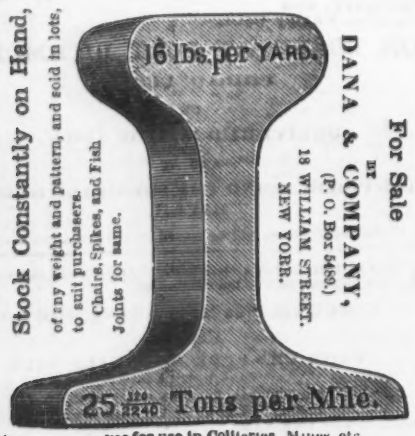

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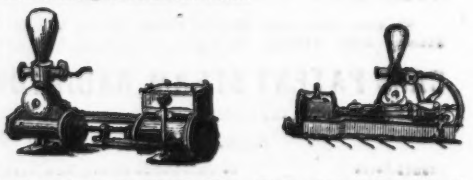

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